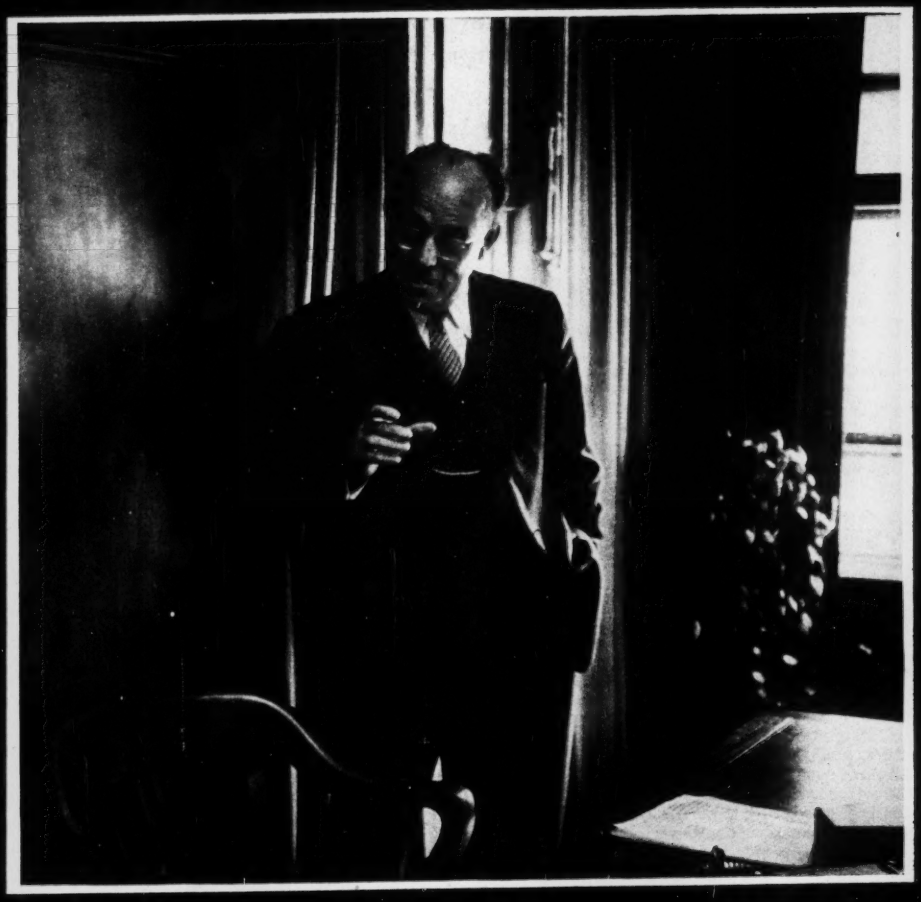
ENGINEERING NEWS-RECORD



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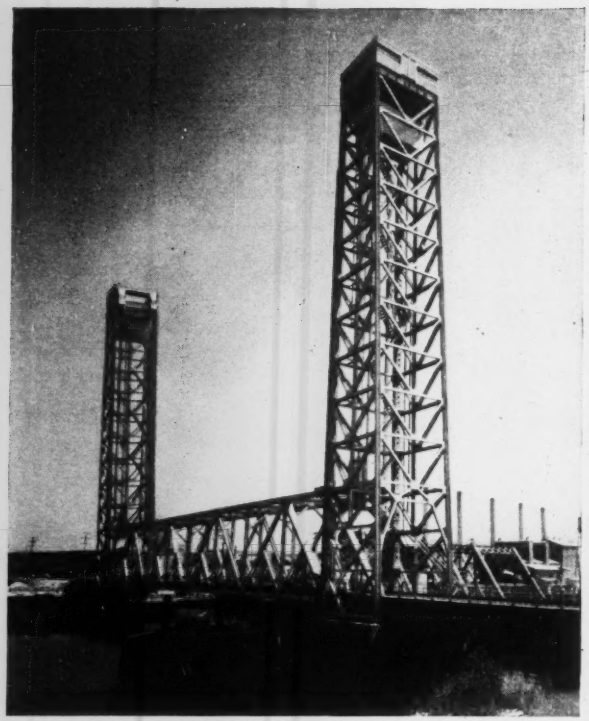
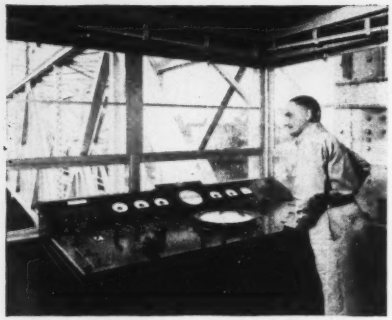
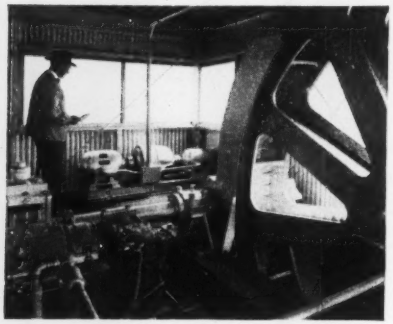


AMPLIDYNE CONTROL—first applied to movable bridges by G.E.—permits raising and lowering Oakland's new Fruitvale bridge in a shorter time than by any other method. Amplidyne control responds instantly, provides faster acceleration and deceleration.



BRIDGE OPERATION is centered in operator's console. Amplidyne's closer control keeps ends of span aligned during operation, "seats" bridge accurately and smoothly.



REDUCED STRESS ON BRIDGE structure and machinery results from torque limiting, inherent in amplidyne control. Photo shows part of G-E drive equipment in east tower.

Smooth, pinpoint control speeds bridge operation

G-E amplidyne-controlled drive prevents skewing, seats span faster, protects structure from shocks

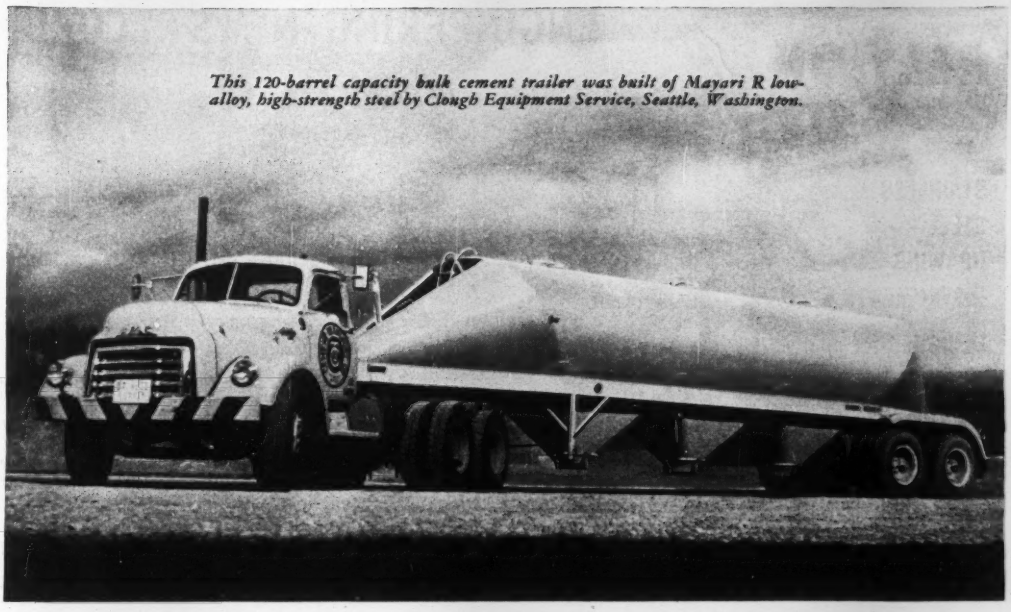
Key to precise control, faster operation, and better equipment protection of Oakland's new Fruitvale Avenue Lift Bridge is its General Electric amplidyne-controlled drive system. Working closely with Woodruff & Sampson, consulting engineers for the Corps of Engineers, Judson Pacific–Murphy Corp., general contractors, and Enterprise Electric Works, electrical contractors, G.E. has again engineered the versatile amplidyne into an outstanding movable-bridge system.

This is but one example of the help G-E engineers can provide *your* engineers or consultants on installed equipment for heavy construction projects. Contact your G-E Apparatus Sales Office. General Electric Company, Schenectady 5, N. Y. 664-23

WORLD'S FIRST amplidyne-controlled lift bridge—pioneered by G.E.—is Stickel Memorial Bridge in New Jersey. Consulting engineers were Hardesty & Hanover.

Engineered Electrical Systems For Heavy Construction

GENERAL ELECTRIC



This 120-barrel capacity bulk cement trailer was built of Mayari R low-alloy, high-strength steel by Clough Equipment Service, Seattle, Washington.

THEY CUT 1500 LBS DEADWEIGHT FROM THIS BULK CEMENT TRAILER

Low-alloy, high-strength steel did it. By using Mayari R the builders of this bulk cement semi-trailer were able to reduce the deadweight by 1500 lbs while adding to the overall strength.

The trailer has an all-welded tank-type hopper body, dual axles, flanged-and-dished hopper heads, air jets and vibrators. Heavy truss frames ordinarily used in trailers of this type have been eliminated. Excellent roadability and stability have been gained by lowering the center line of load.

Mayari R is well suited for vehicles like this because of its higher mechanical properties. It enables designers to use thinner, lighter sections without cutting strength or corrosion-resistance. You can use Mayari R in the as-rolled condition without heat-treatment. You can form and fabricate it by the same methods that you use for plain carbon steel, and weld it by the usual gas and electric processes.

If you are designing any kind of product where weight reduction, greater strength, or superior resistance to atmospheric corrosion are important, it will pay you to find out more about Mayari R.

Write or phone any of our sales offices for Booklet 259, giving detailed information about Mayari R.

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ENGINEERING NEWS-RECORD

ABP Member

Volume 149 October 30, 1952 No. 18

WALDO G. BOWMAN
Editor

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ROBERT F. BOGER
Publisher

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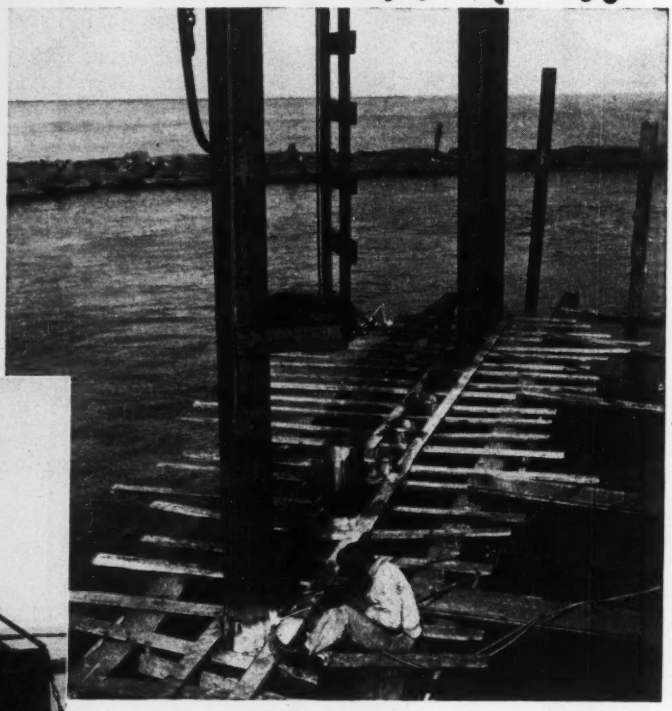
MONOTUBE'S light weight and extendibility pays off!



Inset shows Monotube piles being driven with 58′ reach.
Project: Cleveland Memorial Shoreway
Engineers: Ohio State Highway Department
General Contractor: National Engineering and Contracting Company, Cleveland, Ohio.

Standard crane drives 150′ Monotube piles 58′ from Lake Erie shore

NO need for special rigs and heavy driving equipment on this job! Light weight, *cold-rolled* fluted steel Monotubes were easily driven from the shore by a standard crawler crane with a 58′ reach. They were put down in sections, welded on the spot and—when completed to an average length of 150′—inspected to their tips before concreting.

Monotube piles are paying off better on all types of jobs. Our engineers will be glad to consult with you on *your* specific problems. For complete information write The Union Metal Manufacturing Company, Canton 5, Ohio.

UNION METAL
Monotube Foundation Piles

Saves 3¢ to 5¢ per yard over competitive equipment

with Heiliners!

These job-study figures prove it!

The contractor on this Northern Ontario highway job used two 200-hp Heiliners — and two other similar diesel-powered units. The soil was heavy red clay full of boulders. At times, the back wheels of the scrapers went as much as four feet off the ground, as the scrapers got under the boulders. Conditions were plenty tough!

Even so, the Heiliners moved 18 cubic yards at a crack — 75 to 80 loads a day. The trip from borrow to fill was about ¾ mile. Fuel consumption for each Heiliner was only 4.1 gallons per hour.

Here's how Heiliner performance stacked up against the other two self-propelled scraper units, during an average day's operation — figuring wages, fuel and maintenance:

Heiliner - - - -	6.98¢ per yard
Machine "A" - - -	9.88¢ per yard
Machine "B" - - -	11.99¢ per yard

See what Heiliner advantages can do for *you*. Have your Heil road-machinery distributor demonstrate the Heiliner that meets your needs: Series 800 Heiliner — with 18-cu. yd. scraper and 20-cu. yd. dump wagon. Or the Series 500 Heiliner, 13-cu. yd. scraper.

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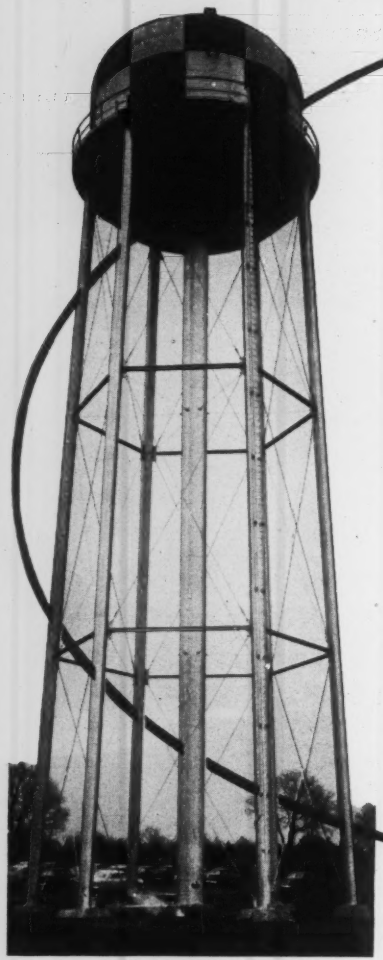
R-135

POSEY IRON Saves Tank Buyers Money at 4 Fabrication Points



Large industries . . . and small . . . save money by consulting the Posey Iron Works at four critical points in tank fabrication:

1. *When type and size of tank are being determined.* In its forty-two years of practical experience, the Posey Iron Works has accumulated a thorough "backlog" of helpful information.
2. *When special storage problems must be solved.* Posey Iron has the facilities required to meet special requirements.
3. *When corrosive liquids must be handled.* Posey Iron engineers are well qualified to advise on the alloys needed to handle the various corrosives—including sulphuric acid.
4. *When tank is ready for erection.* Posey Iron is equipped to give complete service in erecting tanks. Posey Iron Tanks are constructed with flat, ellipsoidal or radial cone bottoms . . . with structural or tubular columns. All standard codes are met. It may pay you to check with Posey. Write today.

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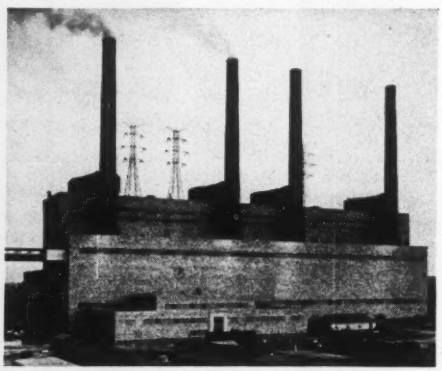

Recently installed Posey Iron tank with 150,000 gallon capacity. 34' diameter; 12'6" on straight shell with ellipsoidal top and bottom.

These four Posey Iron stacks measure 23' diameter x 12'6" diameter x 192' 6" high.

POSEY IRON WORKS, INC.

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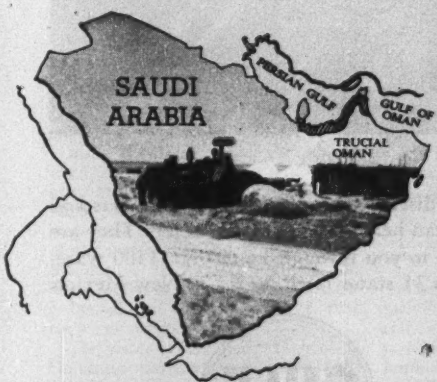
Building access road from temporary personnel camp to main cross-country highway (the only *permanent* road along the Trucial coast), Tournadozer drifts 2.5 cu. yd. (1.9 m³) load of sand. Road will be used to transport truck loads of ½ to 25 tons.

250 miles from the nearest oasis

in desert temperatures to 150° F., rubber-tired TOURNADOZER builds roads for oil exploration



Tournadozer—Trademark Reg. U. S. Pat. Off. EX184 b1

To speed exploration of potential oil fields, Iraq Petroleum Co., Ltd., of Tripoli, Lebanon, is using a highly mobile C Tournadozer to build and maintain roads, level campsites and storage areas, and prepare drill locations.

Currently on expedition to the remote coastal desert country between the Persian and Oman Gulfs in Saudi Arabia, the Tournadozer has to operate in temperatures ranging from 35° to 150° F. Its work is entirely in sand—mostly dune and desert blow sand, with occasional outcroppings of sandstone and coralstone, and some salt flat areas. Despite these severe conditions, the Tournadozer has been working steadily 10 to 18 hours daily for the past year. Only servicing required during this time has been a routine weekly inspection. Tires have stood up well under the extreme heat and in the abrasive sand that cause excessive wear on the many moving parts of track-type equipment. This trouble-free operation is of prime importance. The nearest major repair facility is across the desert, more than 250 miles away.

Because of this dependability and greater operating speed, Tournadozer now handles ⅘ of the earthmoving requirements while a crawler-tractor handles only ⅕. By driving from one task to the next at speeds up to 19 m.p.h., Tournadozer has been a major factor in keeping landleveling, road building and road maintenance ahead of schedule.

Another of this machine's major advantages is its simple system of steering and its electric "push-button" blade control. Operation is so easy that inexperienced Arabian workers have very little difficulty in maintaining high standards of production.

Like Iraq Petroleum Company, progressive contractors, mines and industries all over the world are taking advantage of this advanced, easy-to-operate earthmover. If you are interested in the economics of modern, rubber-tired, high-speed equipment for faster, lower-cost completion of your projects, your local LeTourneau Distributor can help you. He will gladly analyze your equipment needs at any time.

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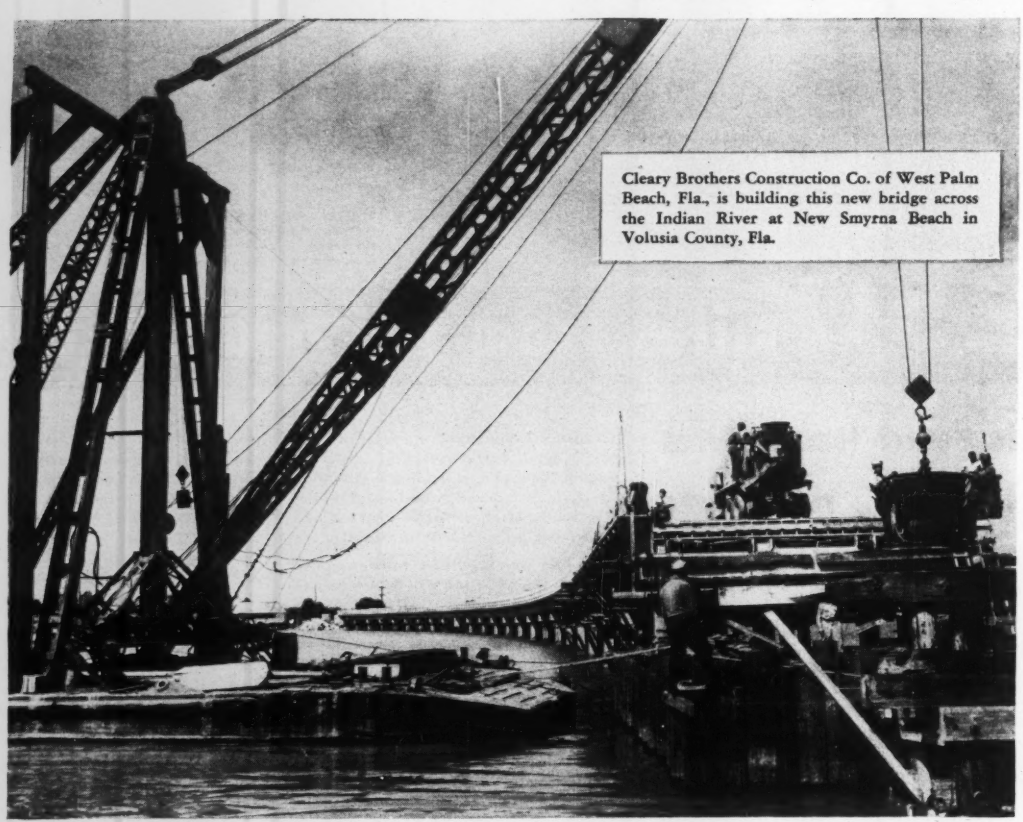
on Florida Bridge Project



Cleary Brothers Construction Co. of West Palm Beach, Fla., is building this new bridge across the Indian River at New Smyrna Beach in Volusia County, Fla.

ANOTHER important construction project where equipment is making an outstanding record of dependable performance with the help of Gulf quality products and service.

Here are a few of the reasons why so many leading contractors prefer the products identified by the familiar orange disc: Gulf lubricants provide an extra margin of protection. Gulf fuels help insure full power. Gulf supplies expert engineering counsel and prompt delivery service. Result: fewer delays, lower maintenance costs, bigger profits!

Let us discuss with you how our products and services can help you on your next job. They are available to you through more than 1400 warehouses in 31 states from Maine to New Mexico.

GULF

READER COMMENT

Right bridge, wrong caption

Sir: In your September 25 issue you presented a very interesting series of photographs and descriptions of the 1951 prize winners and honorable mentions in the Aesthetic Bridge Competition conducted annually by the American Institute of Steel Construction.

There was a serious error made, however, in connection with the winning bridge in the Class III competition—for bridges with spans under 400 feet, costing less than $500,000.

You show the correct photograph of the prize winner, but the caption refers to another bridge. The bridge which won the award is the Grove Street Overpass, Route 128, Lexington, Massachusetts, built for $134,000, having two spans of 60 feet, and two of 34 feet.

L. ABBETT POST
Executive Vice President
American Institute of Steel Construction, Inc.

Decimal point astray

Sir: Your attention is invited to an erroneous statement on p. 69 in the article, "Sea water desalting research work undertaken by Bureau of Reclamation," ENR Sept 25. Relative to cost, the statement "the cost of filtration of water in Washington, D. C., is 16 cents per thousand gallons" is decidedly incorrect. The overall cost of the treated and filtered water produced by the Washington Aqueduct is one and six-tenths (1.6) cents per 1,000 gallons.

The water rate charge in Washington, D. C., falls just above the medium rate for cities above the 500,000 population class. The estimated population of Washington and environs served with water is 1,084,000.

Since there are several component parts in the construction and operation of the water facilities for all major cities and utility districts which vary with the location of the source of the water, size and topography of the city, a brief description of the Washington system is furnished with a breakdown of costs for the past twelve-month period.

The water system of the District of Columbia and environs has two compents, viz—the Supply Division and the Distribution Division. The Supply Division, known as the "Washington Aqueduct," comprises the collection and purification systems consisting of dams, conduits, raw water reservoirs, filtration plants, pumping stations, certain transmission mains and filtered water reservoirs, is under the control of the Department of the Army and, through the Chief of Engineers, is operated directly by the Washington District Office. The Distribution Division, comprising trunk, secondary, and service water mains, fire hydrants, water meters, high-service storage reservoirs and tanks, and pumping stations, is under the control of the District of Columbia and is operated by the Water Division of the Department of Sanitary Engineering.

Washington, D. C., obtains its water supply from the Potomac River upstream of Great Falls at El. 152, ten miles above the northern boundary of the city. Last year, 39,600 mg were filtered through 29 slow sand filters of one acre each, and 24,200 mg were filtered by a rapid sand filter plant consisting of 20 filters, each of 425 mgd capacity.

Washington Aqueduct supplies the water for Washington, D. C.; to Arlington, Va.; to Falls Church, Va.; to federal installations in nearby Maryland and Virginia; and a minor amount to the Washington Suburban Sanitary District on summer peak loads.

Total production for the past fiscal year was 63.8 billion gallons. The average daily production was 174.5 mg with a maximum day of 236.9 mg and a minimum day of 133.4 mg.

Operating cost for fiscal year 1951-1952:

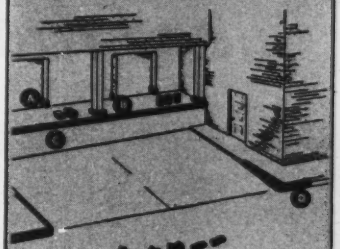
		Cost per 1,000 gal.	*Total Year*
Collection		0.42¢	$268,356
Purification:			
(a) Sedimentation	0.03¢		
(b) Filtration	1.09¢		
(c) Chemicals	0.49¢	1.61¢	1,026,258
Pumping:			
(a) Power	0.43¢		
(b) Other	0.30¢	0.73¢	
Transmission		0.03¢	
Total operating costs for Washington Aqueduct (Supply Division) of system		2.79¢	$1,779,012

The above operating costs do not include interest on investment, depreciation, or cost of distribution which is performed by the District of Columbia.

This information is forwarded for the benefit of your readers who may not know the extremely low unit cost of potable water from a modern water system in a large city. Good potable

(Continued on page 11)

ARMORED CONCRETE
for column guards (A - B)
for loading platforms (C)
for all forms of curbing (D)



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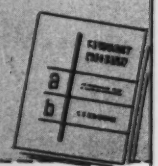

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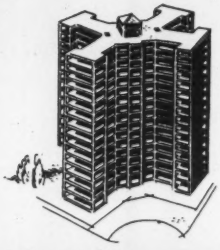

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Reinforced concrete frames are inherently firesafe, and withstand wind, shock, and quakes. On your next structure it will pay you to *design for reinforced concrete.*

CONCRETE REINFORCING STEEL INSTITUTE • 38 South Dearborn Street, Chicago 3, Illinois

READER COMMENT

(Continued from page 9)

water is the cheapest commodity that the American public purchases today.

D. M. WATT
Chief, Operations Branch
Washington Aqueduct
Wash., D. C.

Correction

Sir: Your issue of August 21 (p. 90) has just come to our attention, with its report covering work on the Ohio in fiscal year 1952, plus a glimpse ahead to fiscal '53.

I call your attention to the sixth paragraph of your version in which you wrote that for "fiscal 1953, they (expenditures) will reach an estimated $193.5 million." Not so!

The fact is that next June likely will find 12 additional flood control and flood protection projects completed or effectively so, representing an outlay at the time of $193,483,900.

In other words, cumulative costs over the years since they were started, totaled that figure—not to be considered for any one year alone.

Otherwise, the article was very much to the good, and we appreciate your attention to it.

PAUL B. MASON,
Chief, Technical Information Branch
Ohio River Division
Cincinnati, O.

108 Years old

Sir: In your April 24th, 1952 issue you published a letter from Carl R. Langer, inquiring which is the oldest United States construction company.

This company has been engaged in excavation and heavy construction operations since it was established in 1844 by Charles W. Blakeslee. In 1944 we issued a 100th Anniversary Book "A Century Of Heavy Construction By C. W. Blakeslee & Sons, Inc., Through Three Generations". We believe that we are one of the oldest construction companies in the country.

HAROLD L. BLAKESLEE,
Treasurer,
C. W. Blakeslee & Sons, Inc.

CALENDAR

Structural engineering conference, University of Illinois, Urbana, Nov. 12-14.

Inter-American Association of Sanitary Engineering, conference, Buenos Aires, Argentina, Nov. 19-30.

Society for Experimental Stress Analysis, Hotel McAlpin, New York City, Dec. 3-5.

Illinois traffic engineering conference, University of Illinois, Urbana, Dec. 11-12.

RIP-RAPPING with 32 Ton Stones

*Morrison-Knudsen Co.
Contractors—Boise, Idaho

An *exclusive* Owen Grapple feature contributed greatly to the speed, safety and success in placing thousands of tons of rip-rap to protect the down stream banks at Grand Coulee Dam.

The granite stones varied from 12 tons to 32 tons and no two were similar in shape.

Because of its Patented independent tine action the Owen Grapple alone could grasp such difficult objects with pressure exerted equally through all 4 tines regardless of the irreggular shapes of the stones.

If you use grapples, investigate this exclusive Owen feature which speeds operations, increases safety and lowers per ton handling costs.

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They look even better on paper!

You'll always see Internationals on the tougher jobs. That's because they're as rugged and dependable as they look. But you ought to see 'em *on paper!*

Owners' cost records consistently show amazingly low operating and maintenance costs. These are features actually engineered into every International Truck regardless of its size.

Beyond this great economy, consider the extra years of service, the exceptional cab comfort, and the easy maneuverability you get in an International. All of this says: See your International Dealer or Branch soon!

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Only International Trucks give you all this:

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INTERNATIONAL TRUCKS

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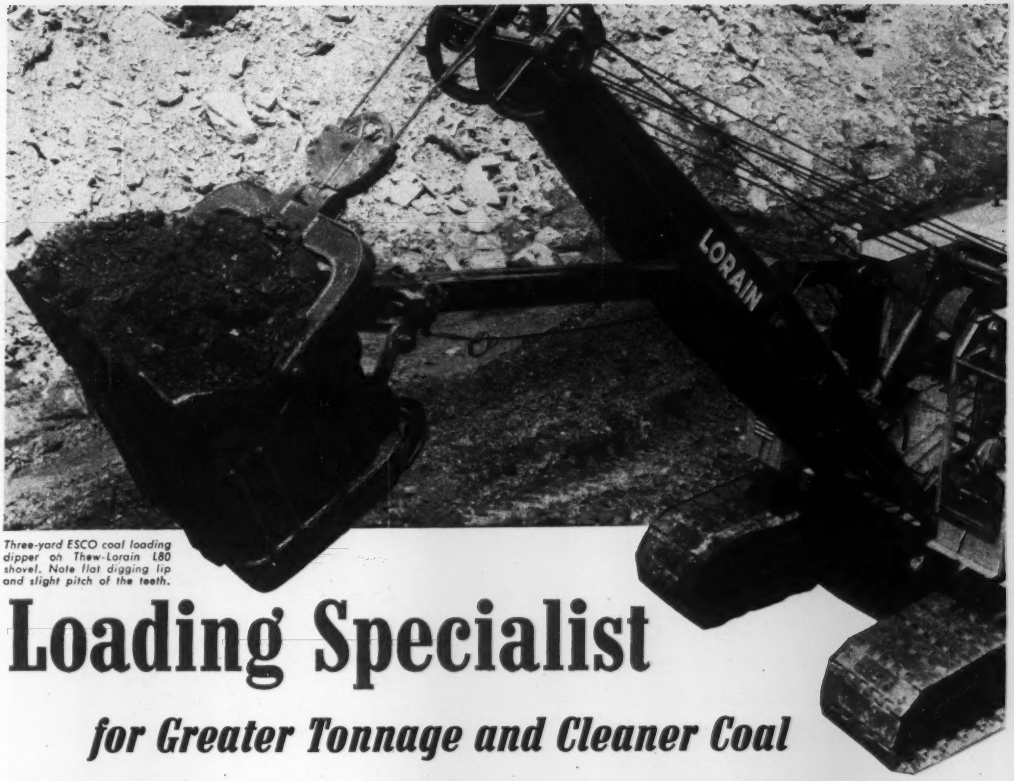
International L-210 series available in GVW ratings from 30,000 to 34,000 lbs., 145, 157, 175, 193-inch wheelbases.



Three-yard ESCO coal loading dipper on Thew-Lorain L80 shovel. Note flat digging lip and slight pitch of the teeth.

Loading Specialist

for Greater Tonnage and Cleaner Coal

You can load more coal with an *ESCO* coal loading dipper — about 50% more than with conventional dipper buckets. And you'll get cleaner coal and a better cleanup in the pit. Here's why —

The *ESCO* coal loading dipper is a specialist, designed and built especially for coal loading. Not only is it from 10% to 15% lighter than ordinary dippers, but also it takes advantage of the comparatively light weight of coal. As a result, it is common practice to use buckets 50% larger than usual, with corresponding increases in production.

Complete Cleanup, Clean Coal

Flat lip of the *ESCO* coal loader, with sharp, closely spaced teeth of slight pitch cleans up coal with a minimum of dirt.

The *ESCO* coal loader is substantial, more than adequate for its job. It is fabricated of steel plate, with teeth, tooth holders, door hinges and latching mechanism cast of wear and shock resisting alloy steel. Web type tooth holders are welded together to form a solid cast alloy steel lip.

Write for Literature on Stripping Buckets

For further information and specifications on the *ESCO* coal loading dipper ask your nearest *ESCO* representative for catalog 173-A showing dragline and dipper buckets for strip mining. Or fill in and mail the coupon.

ESCO Dippers, Hoe Dippers, Stripping, Dragline and Coal Loading Buckets

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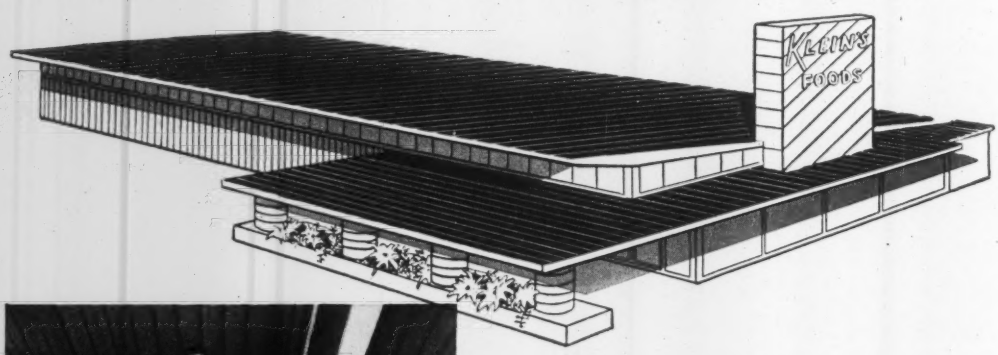

...IT'S WHEELING TRI-RIB STEEL ROOF DECK!

Because of Tri-Rib's pleasing appearance, underfinish was *omitted* — deck sheets themselves forming the "ceiling" — fixtures fastened *directly* to roof structure, as seen in the first picture at left.

Because of Tri-Rib's lightness, longer span joists and lighter roof structure, lighter and *fewer* supporting members were used, thus saving a considerable tonnage of structural steel compared to other types of roof construction. Other two pictures show the store's spaciousness.

Because of Tri-Rib's ease of installation, Sebco Construction Company saved time... saved money on this Minneapolis super-market.

Made of Cop-R-Loy, Tri-Rib is designed to specifications adopted by A.I.S.I. for light-gauge structures.

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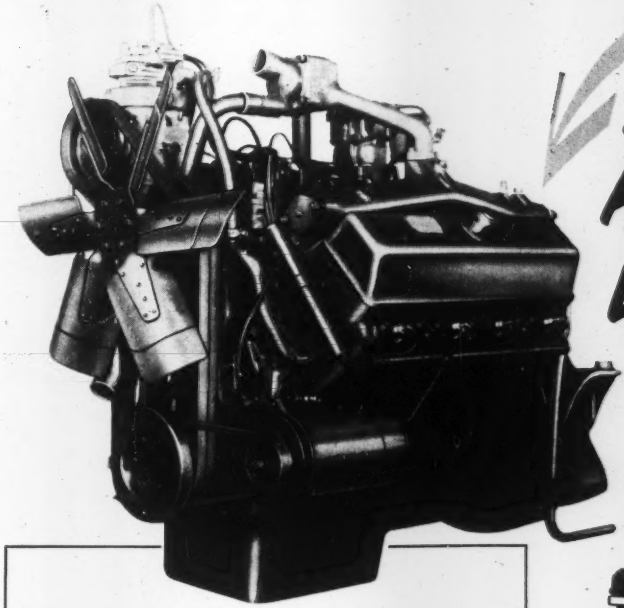

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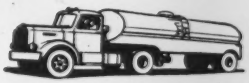
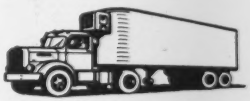
Better look over one of the new Autocars powered by the Le Roi H540 V/8 Engine. It is good for better than 200 hp and has a torque rating in excess of 450 lb. ft. Installed in a new low-weight Autocar chassis, it delivers brilliant performance with low-cost operation. And when highway haulers need it, there's a vital reserve of power waiting under the hood.

AUTOCAR TRUCKS

The Autocar Company, Ardmore, Pa.
Established 1897



TEMPO-OF-TRAFFIC PACE. The Autocar V-8 is a payload hauler with near passenger-car performance. It starts and stops, goes up and down grades quickly and easily.



FULL POWER AND ACCELERATION. Modern carburetion, V-8 design, aluminum pistons, light flywheel, deliver full power and acceleration. The Autocar V-8 has extra power when needed for quick getaways or in emergencies.

If you need extra power, get more details on this sensational new valve-in-head engine. Fill out the coupon below and we'll send you this colorful booklet.

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The Autocar Company, Ardmore, Pa.
Please send me the Autocar V-8 Booklet.

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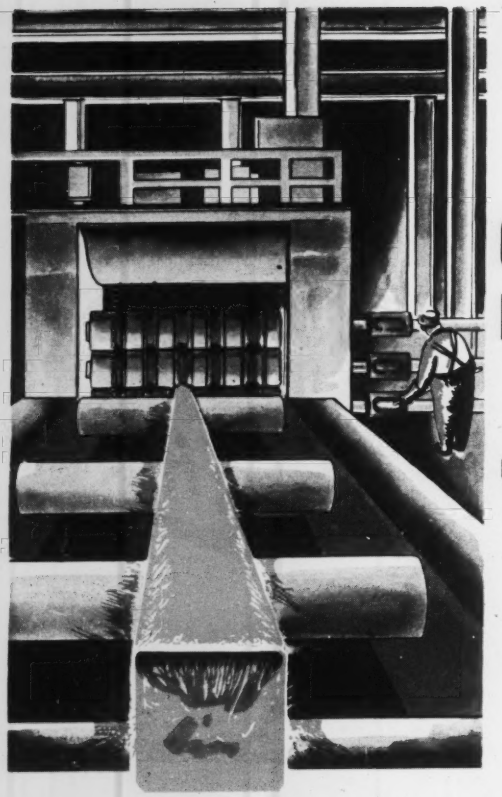
*STREET*_____

*CITY*_____ *ZONE*_____ *STATE*_____

*WE OPERATE*_____ *TRUCKS*
(number)



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The expansion program at CONNORS STEEL COMPANY, now nearing completion, means a 40% increase in production.

While this is important, even more so is the fact that CONNORS' long-recognized Quality also is being "expanded"... This is made possible by the addition of new, modern equipment, including another electric furnace, another reheating furnace plus an additional rolling mill.

New production equipment like this, backed up by other improvements in CONNORS modern control laboratory, means even higher Quality Steel from CONNORS: a name long respected by users of Quality Steel.

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DIVISION OF H. K. PORTER COMPANY, INC.

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Does Construction Help Elect Presidents?

Do economic events determine election results? A lot of people—including politicians in both parties—think they do. And believers can point to a lot of past elections to prove their point, based on construction and commodity price indexes.

There are some obvious past examples. Almost any Democrat could have won in 1932, when Roosevelt beat Hoover. The public then blamed its economic troubles on the administration. Again, almost any Republican could have won in 1896, when economic disturbances in the early nineties were blamed on Grover Cleveland, Democratic President. There are plenty of other examples.

But some observers go farther than just the obvious examples. Louis Bean has pointed out that, with very few exceptions, the party in power has always been re-elected when times were good—and practically always been defeated when times were bad. Most of the exceptions came when third parties entered the field and drew away votes from a party that would otherwise have won.

Three economists at Cornell University have worked this theory out in detail. They measure prosperity by indexes of commodity prices and construction, and they point out that 28 past elections could have been predicted on the basis of the level—high or low—of these segments of the economy or the direction of changes in that level. Two of these economists, using this theory, called the 1948 election correctly when most other observers were wrong.

Here is the record for these 28 presidential elections:

1. The party in power lost seven times on low or falling markets;
2. The ins won thirteen times on high or rising markets;
3. The ins lost four elections when construction was high but commodity prices were falling;
4. The ins won four times when construction was falling but commodity prices were high or rising.

It's clear from the record that commodity prices are the chief factor in this calculation, but construction is important, too.

• **What about 1952?**—Assuming there's something in this theory, what is the situation this year? On the surface, at least, it seems to favor the Democrats. Commodity prices are at high levels. Construction is running at record levels; ENGINEERING NEWS-RECORD's contract figures so far this year are setting records both in dollar volume and in physical volume. Construction put in place also is setting records.

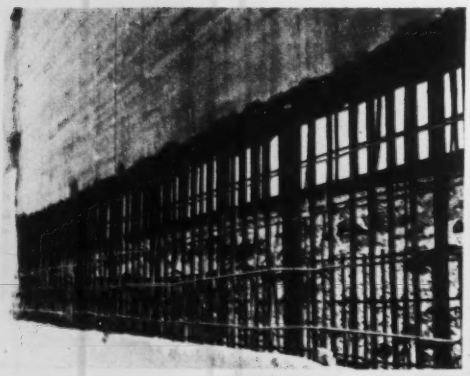
But there's a "fly in the Democratic ointment," according to the Cornell economists; commodity prices are falling. Farm prices have dropped slightly this year, and commodities as a group have been dropping since the spring of 1951. According to the theory, that favors the Republicans—the "out" party. But commodity prices are still at very high levels, even though falling—and that favors Democrats.

• **What it means**—The three economists won't be pinned down to a positive prediction on the outcome of the election—although their theory, on balance, certainly indicates another Democratic victory. There are at least three good reasons for being careful about banking too heavily on that theory.

1. It does not always work. In 1852, for instance, commodity prices were rising fast just before the election. But the in party, the Whigs, was beaten. Considering all the last 32 elections, the odds favoring the ins during prosperous times should be about three to one. That leaves room for exceptions to the rule.

2. It's still only a theory—based on past performance. There is no proof that enough voters will actually make up their minds solely on the basis of prosperity or depression to swing any particular election. The question is obviously important; politicians in both parties are bearing down heavily on claims that they will maintain or increase prosperity.

3. The Korean war has thrown an entirely new element into the picture; one that may have a decisive effect.



Left: Section of flood wall at Kansas City Showing exposed re-inforcement after removal of all damaged concrete prior to Prepakt repair.

Below: Flood wall during Prepakt repair operations. Note weakening crack caused by reverse pressure of flood waters.

THERE'S ONE *BEST* WAY TO DO EVERY JOB...

Whether it's in new construction or concrete repair, there is always one *best* way to accomplish the best results. In an ever increasing number of projects, Prepakt is being chosen as the *best* method to do the job.

Repair of the 25-foot Armourdale flood wall at Kansas City is typical. Reverse loading of this wall by the 1951 flood cracked about 1,100 feet of the wall, seriously weaking the structure.

Prepakt methods and materials provided exceptional advantages in this repair project. First, Prepakt methods *completely* filled the repair openings with high-strength concrete having a superior bond to the old concrete. The low drying shrinkage and high weather resistance of Prepakt Concrete provided the structure with additional strength for long trouble-free service.

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• **"Secret" check?**—For unexplained reasons, the Air Force is keeping the security lid clamped tight on the fact that it has three committees at work looking over its programs, and has let a contract to two architect-engineer firms to help.

Despite security, this much is certain on the construction side:

An Air Force working committee is reviewing and planning to revamp the entire airbase construction picture, in the hope of easing rising Congressional pressure growing out of the recent charges of waste in the $10-billion program for the projected 143-wing Air Force. A joint-venture contract has been awarded to Deleuw, Cather & Co. of Chicago and J. E. Griener of Baltimore to do spadework on research and review.

The Air Force committee—besides uniformed and civilian brass—includes a lot of well-known construction names: J. H. Perry, former Turner vice president and now deputy for installations for Air Force; Fred J. Driscoll, president of George F. Driscoll Co. of New York; G. Dewey Hines, construction vice president for Equitable Life; John P. Rieley, coordinator of construction for New York's schools; Dwight W. Winkleman, Syracuse, N. Y., contractor and former AGC president; Max Abramovitz of Harrison & Abramovitz; George H. Miehls, president of Albert Kahn Associated Architects & Engineers Inc.

• **Green light for Mackinac?**—Michigan's long dreamed—and long debated—bridge across the Straits of Mackinac seems a lot closer to reality. A New York investment banking firm (B. J. Van Igen & Co.) agreed to underwrite the probable $95-million bond issue needed to finance the 26,185-ft structure with 3,800-ft suspension span (see also p. 73).

The Mackinac Bridge Authority happily set about predicting that the bridge would be built within two years, would carry over 2,000,000 vehicles a year, cost $400,000 to maintain—and prepared to get its engineers to work in earnest.

• **Prediction corner**—It was a good week for predictions, political and otherwise. You can take your pick:

Housing starts will stay high—900,000 to 1,000,000 for 1953 (by government housing officials).

Precast concrete units substantially will supplant brick and plaster in building construction within 25 years, because of mounting costs of older materials and improvements in concrete techniques (by Roger H. Corbetta, chairman, New York's Concrete Industry Board).

The U. S. government probably never again will build a wing-type building, since air conditioning makes block-type structures possible, wing-type is too expensive (by Jess Larson, Administrator of General Services).

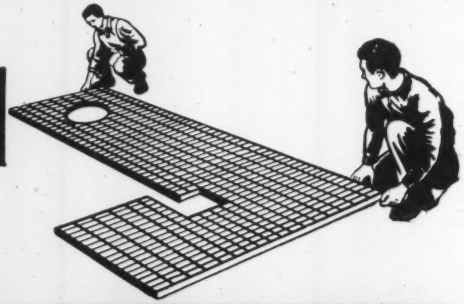
There'll be plenty of expansion of industrial and community facilities coming up soon in Alaska. Interior Department made this more than a prediction, when it withdrew 7,400 acres of public land around Skagway for study of future development.

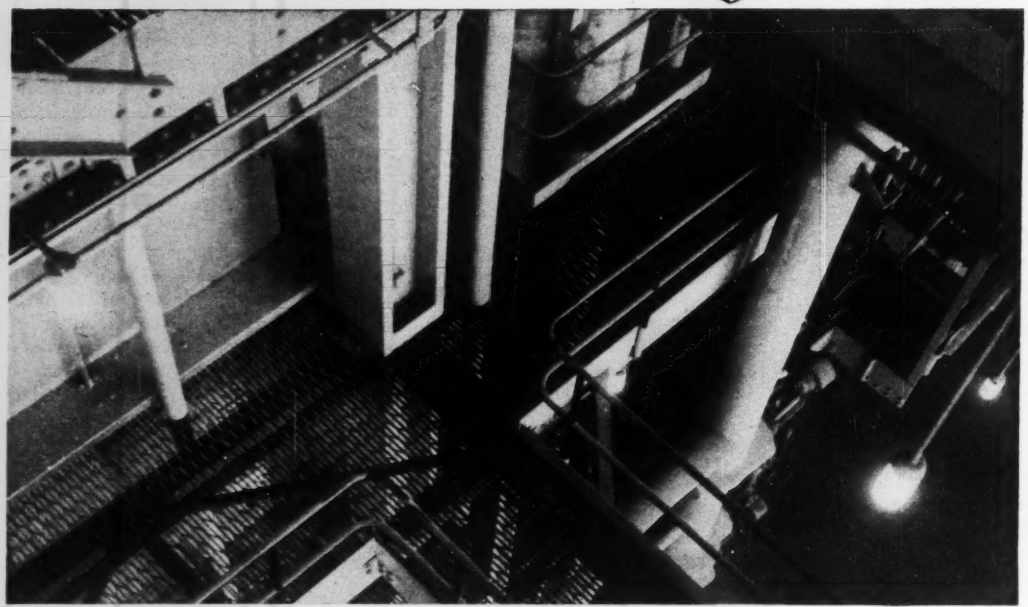
Prices will stay generally stable next year (with some ups and downs that'll even out), wages will continue to edge upward (Washington's ever-present pundits).

• **Pike**—Wisconsin got ready to climb on the toll-road bandwagon, with approval of a proposal to create a turnpike authority. The new authority—if approved by legislators— would be charged with development of a $180-million road, slashing diagonally across the state from the Illinois line west of Kenosha, northwest toward St. Paul-Minneapolis. First question: Will it pay?

SPECIFY BORDEN AND

SAVE ON FLOOR GRATING INSTALLATIONS . . .





avoid costly field corrections with

BORDEN'S *free planning and checking service*

In filling your order, Borden follows these steps to insure correct dimensions, fit and placement.

1. A shop drawing of the job is submitted to the customer for approval, when necessary. This plan shows the size and shape of the grating area—how grating clears all obstructions.

2. Each finished panel is carefully checked for accuracy of dimensions.

3. Each panel is plainly marked with its number to insure quick, easy installation.

4. The entire platform is laid out on our shop floor. Overall dimensions and obstruction openings are checked against shop drawings.

5. Erection diagram showing panel mark numbers is supplied for field installation.

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describing services and features of Borden Floor Gratings.

Borden manufactures all three types of floor gratings, servicing from strategically located plants.

BORDEN METAL PRODUCTS CO.

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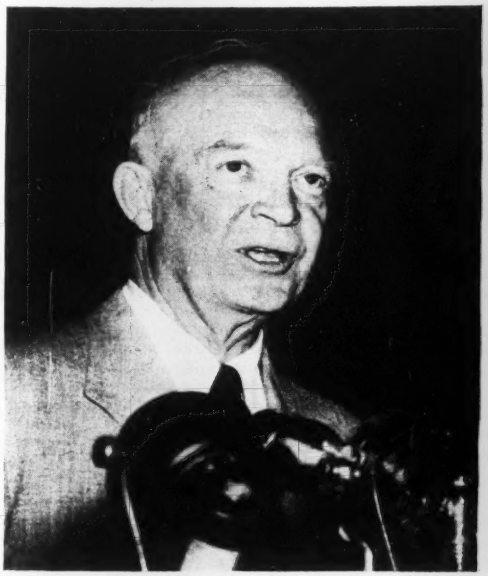
Main Plant — Union, N. J.



What the election means to construction

ENR staff report

No matter what the outcome of next week's national election, the results won't alter greatly the total impact of federal spending and federal policies on U. S. construction.

You can pretty much rely on a prediction that overall construction activity during the next four years will roll on at a high level regardless of the political color of the management—whether Democratic or Republican.

In a broad sense, that forecast holds good for the federal share of construction activity as much as for overall volume. Realities of the situation demand that the federal government go ahead with programs already started. There may be shifts of emphasis, but the sum total of federal construction spending will be about the same under one party as under the other.

In the bigger field of private construction, activity will, as usual, depend primarily on the state of the economy, with only minor adjustments to fit helpful or harmful influences of government policy. If the country stays prosperous, as it gives promise of doing, private building will trend steadily upward regardless of actions by Congress or the Executive Branch.

This broad appraisal does not apply to all parts of the construction complex. Some segments would feel the effects of changes in federal policy. Here is the way the future might shape up for certain categories:

● Housing outlook

In the main, housing will fare well under either party. No candidate has a word to say against government aids to private home building. Government insurance and guaranty of FHA and VA mortgages will remain in full effect.

In fact, they might become even more important under Eisenhower. The Republicans in Congress have generally aligned themselves on the side of what is commonly called the "real estate lobby," meaning the realtors, home builders and lenders. With the GOP in charge, the agencies might see reason to raise interest rates as builders and bankers have long urged.

Such a rise probably would increase the volume of home financing by insured and guaranteed loans. As a parallel, it would likely mean, too, that a bigger share of mortgages would have this government backing. FHA might even become a dominant, rather than an influential, factor in the home-financing field—going considerably beyond its original concept and purpose. But that possibility is mere guesswork now.

Whether public housing holds steady at a low level or drops farther will depend largely on the party in power. Despite Senator Taft's original sponsorship of local low-rent housing, the Republicans have throttled the program; only 35,000 units can be started this year, instead of the 135,000 authorized by the Taft-Ellender-Wagner Act of 1949.

The downward trend may continue even if the Democrats win next week; only a change of congressional attitude could reverse that trend. Stevenson is committed to the party platform pledge to fulfill "the programs of private housing, public low-rent housing, slum clearance, urban redevelopment, farm housing, and housing research"; but he adds that the problem need not be met entirely by the federal government, and will go on "just as fast as a sound economic policy will permit."

Defense housing will move ahead on its present schedule regardless of political shifts. Some 200,000 pri-

vately built houses probably will be financed under the liberal mortgage insurance allowed for this housing. More than 100,000 units will be programmed before the end of the year. But no Congress is likely to increase the $50 million authorized for government-built temporary and trailer housing.

• Defense construction

Expenditures for military construction in the United States and overseas will continue at the rate of about $3 billion a year for the next 26 months, no matter which party controls the government. By that time, the spending rate for construction will begin to decline, according to present plans of the Defense Department.

Eisenhower has promised to tighten up on building of defense bases. He cited the Moroccan bases, where he said the U.S. should have gotten five bases for the price it paid for two, if the operation had been properly organized.

On atomic energy for defense, the two parties are in agreement. They both support the present expansion program of the Atomic Energy Commission, and they undoubtedly would approve any additional programs that might be recommended by responsible authorities.

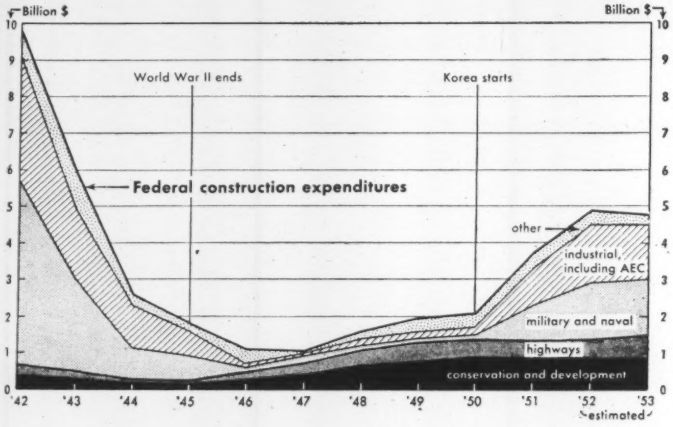
Likewise, the parties are expected to favor any moves the government can make to encourage peacetime applications of atomic energy. Stevenson has specifically advocated that course of action in his campaign speeches. Eisenhower is believed to be in substantial agreement.

• More power ahead

Both candidates spent a great deal of time discussing government construction of large multi-purpose storage dams; they are both in favor of it, but they both hint that the government should be tight-fisted about putting money into these projects.

On the question of administration of big dam projects, Eisenhower calls for local and state interests to wield more influence in the planning and allocation of benefits from these dams. Stevenson thinks the federal government should be the leader and arbiter in projects of this kind.

Stevenson further has said that a study should be made to coordinate the federal government role in river basin development. This view indicates a feeling that undivided responsibility should be centered in one government department or agency. But Stevenson, if he should win this time, would have his eye on the 1956 elections. He might delay tackling the tough Army Engineer-Interior Department problem.



Stevenson also has mentioned the Hoover Commission recommendation for a board of review, attached to the President's office, to screen all projects. He says that the proposal should be studied to see whether it is the best way to coordinate project planning. Eisenhower has not expressed an opinion on this detail, but also has promised to "dust off" the Hoover report.

Eisenhower has stressed major participation of local interest in the planning, construction and ownership of all projects, including power works. While both candidates have endorsed the Tennessee Valley Authority program, Eisenhower cautions that he does not consider it a "rigid pattern for such development in other regions." He cites the Missouri Valley as a specific exception.

Stevenson, on the other hand, has called for more coordination among all interests, public and private, on power development.

• **An example**—Hells Canyon is an example of a project that will be at issue under the next administration. If Eisenhower wins and carries with him a majority in either House or Senate, the Republicans undoubtedly will block the Reclamation Bureau's $360-million plan for the Big Snake River power dam. Idaho Republicans are dead set against the project and their colleagues in Congress would vote with them.

There is no certainty that Hells Canyon would go through even under Stevenson. But with the Republicans in power, the big project might be blocked for good. The Idaho Power Co. has before the Federal Power Commission an application for a license to build a small run-of-river plant in the canyon—the first of five proposed.

After January 1, there will be only one member of the five-man commission who would assuredly oppose the power company application. The new President will appoint a successor to another member whose term expires at year's end. With a little pressure from the White House, the FPC next year likely would grant the license. Significantly, the commission recently postponed hearings on the application from Nov. 17 to Jan. 12.

• **Struggle looms**—But the real test on public versus private power will come on the redevelopment of Niagara Falls to add about 1.1 million kilowatts of dependable energy. Here a clearcut decision will be made as to whether the power facilities costing more than $300 million are to be built and operated by private enterprise, a state agency or the federal government.

For both candidates, the best guess is that the New York State Power Authority will get the job. In the Republican camp, Governor Dewey and Senator Ives are pulling for this decision, as also is Eisenhower's public power adviser, John Burton, chairman of the New York State Authority.

Stevenson gives signs of leaning in the same direction. State and federal plans for Niagara have been well presented to Congress. The private proposal of a five-company combination headed by Niagara-Hudson is a Johnny-come-lately in the proceedings.

Both candidates favor the St. Lawrence Seaway and Power Development. Both are for the project in one way or another.

In fact, Canadian initiative in at-

tempting to start the seaway has forced the issue to a point where the next Congress is almost sure to vote U. S. participation in joint seaway and power development. Congressional debate would put the power fight right back in the middle. If Congress does not reserve the project for federal government construction, the FPC could license the New York State Power Authority to build and operate the American power facilities. That probably would be Eisenhower's choice, but not necessarily Stevenson's.

• Transportation projects

Federal aid to local airports won't be increased appreciably under either Republicans or Democrats until defense expenditures can be cut. Several millions will be voted for Washington's second airport during the next four years, after the Civil Aeronautics Administration straightens out legal tangles on the site and gets construction rolling.

Regardless of the party in power, Congress almost certainly will liberalize federal aid to highways under the next administration. Pressure for faster action on road improvements is growing in all parts of the country, and congressmen will respond to popular demand. Aid has been approved already for the next two fiscal years at a rate of $575 million a year. Both Stevenson and Eisenhower sent messages to the American Trucking Association emphasizing the need for improved highways. Both said the country's transportation system should be expanded.

• Hospitals and schools

Both parties favor federal grants for local hospitals and for schools in federally burdened areas. These grant programs are expected to continue at about the levels indicated in the chart on opposite page for the next few years.

Stevenson points out that about 1,500 such hospitals are going up or have already been completed throughout the country, and this "is only a sound beginning" to meet the needs.

Eisenhower points out that by 1958 it is estimated the school system will have a shortage of 600,000 classrooms. "We must now undertake to help needy states build schools."

The Veterans Administration hospital construction program is nearing completion. There are no plans by either party at present to extend or expand that program.

• Controls

Materials and price controls are expected to disappear by spring or early summer regardless of election results. Wage controls will be washed out about the same time.

Barring unforeseen developments, they probably will be totally abandoned—faster under Eisenhower than under Stevenson.

• Outlook is bright

Whatever changes may occur in Washington next January, they will have small effect on government construction spending in 1953. Programs for the year already have been pretty much determined by past actions of Congress and the executive departments. Funds now being spent will carry the programs to June 30 and beyond. Congress, as always, will vote money to continue projects that have been started.

Prospects for federal construction spending next year are shown in the accompanying table. Most of the estimates are self-explanatory. For several categories not listed individually in the table, a few words should be added.

Federal expenditures for government-owned hospitals—such as those built by the Veterans Administration—are estimated at $100 million for 1952. Next year, that item of federal construction spending is expected to drop to $60 million, as the veterans program and other nonmilitary hospital projects taper off.

Federal-aid funds spent this year for public and non-profit hospitals will amount to about $120 million. For next year, this item of federal construction spending probably will decline to $80 million.

Grant money from the federal government spent for school construction this year will total about $72 million. Nearly all of this goes to help schools in federally affected areas. In 1953, federal-aid funds spent for this purpose are expected to go up to $150 million. The U.S. Office of Education has allocated nearly all of some $300 million so far appropriated for construction grants to school districts in areas burdened by defense activities.

Airport aid next year will continue at about the same level as this year. The estimate of federal-aid funds expended in 1952 is $20 million, and 1953 expenditures for airport construction aren't expected to vary much.

AGC-NECA set up bid-shopping group

General and electrical contractors got together last week and reportedly agreed on appointment of a joint committee to iron out difficulties between the two groups. First and toughest of the issues facing the new committee is the conflict between the two over the best approach to the problems of bid shopping and bid peddling.

Presidents of the Associated General Contractors and of the National Electrical Contractors Association took prompt action to clarify actions taken at the recent NECA convention (ENR Oct. 16, p. 21). They quickly agreed to create a fifteen-man joint committee: Arthur S. Horner of the AGC naming nine men to represent the organization's three contractor divisions, and D. B. Clayton, Sr., appointing one for each of the six regions of NECA.

Federal expenditures (in millions) for construction in continental United States

	'42	'43	'44	'45	'46	'47	'48	'49	'50	'51	'52 Estimated	'53 Estimated
Total	9,788	5,877	2,631	1,836	1,114	1,249	1,595	1,965	2,132	3,653	4,865	4,790
Non-residential buildings	3,569	1,941	1,299	837	156	191	316	504	585	1,288	1,965	1,840
Industrial (including AEC)	3,437	1,870	1,230	755	113	96	196	177	224	958	1,600	1,500
Military and Naval	5,016	2,550	837	690	188	204	158	137	177	1,019	1,570	1,580
Army and Air Force	3,953	1,660	319	312	90	102	71	75	123	805	1,200	1,200
Navy	1,063	890	518	378	98	102	87	62	54	214	370	380
Conservation and development	357	285	163	130	240	394	629	793	881	860	830	835
Bureau of Reclamation	60	42	36	39	60	125	175	223	255	207	175	175
Army Engineers (civil)	130	160	73	63	147	222	383	501	538	488	460	460
TVA	131	76	45	18	17	28	39	34	48	109	135	130
Other	16	7	9	10	16	19	32	35	40	56	60	70
Highways	295	199	91	70	206	330	424	463	441	445	534	600
Federal aid	278	192	84	59	180	296	385	406	395	395	490	550
Federally owned roads	17	7	7	11	26	34	39	57	46	50	44	50
Residential	363	694	203	80	309	120	43	33	15	10	10	10

Massachusetts hammers out system for construction of public buildings

(First of two articles)

The row between general contractors and subcontractors over the Massachusetts law regulating contracts for public building, has reached the stage of uneasy truce.

The general contractors are not completely satisfied with it, nor are the subcontractors and the building trades. But almost all agree that the law has its good points.

The experience gained and the lessons learned in the process of its development have a national significance. They offer food for thought in other states; and they have a direct bearing on legislation pending before Congress to regulate bid shopping on federal public works.

Through court decisions, administrative interpretation, and better understanding, Chapter 149 of the Massachusetts general law is gradually evolving into a law which: (1) puts general contractors on a fair and equitable basis for bidding; (2) protects subcontractors from bid shopping and delays in payment; (3) saves the state some money.

More changes are being worked out. They are being tailored to cut down red tape and administrative delays, and to permit designers greater freedom to plan and build better structures at less cost. To map these changes, the state has called on some of the country's top engineering talent, and legislation is now being made ready to put them into effect.

Massachusetts is learning the hard way, but it is learning. There has been heated controversy as well as factional strife, and there may be more. A lot of wounds are still raw, but on the whole the conflict appears to be subsiding, and there is real promise that something worthwhile is being produced.

• Legislative melee

Chapter 149 of the general laws went on the books in 1938. It had certain obvious shortcomings, and was amended in 1939 and 1941. Since that time the law has not been changed, but the procedure for administering part of it was changed in 1947 when the Massachusetts Public Building Commission was set up.

As the law operates today, state or municipal public building projects are bid this way: The general contractor submits in Item 1 all the work he is going to do himself, in Item 2 he submits the bids of the subcontractors he has selected, giving their names and the amounts of their bids. The award goes to the responsible general contractor who has submitted the lowest total for Items 1 and 2.

To avoid any shopping of bids, duplicates of the subcontractors' bids are filed two days before those of the general contract proposals, and are not opened until after selection of the general contractor.

This, of course, is an over-simplification; the procedure is carefully outlined in details of regulation, and out of these details have grown some interesting ramifications to be noted later.

The point here is that, under this procedure, both the general contractors and the subcontractors grew very discontented. Their discontent culminated in proposals to amend the law. Four such proposals were submitted to this year's session of the state legislature. They precipitated one of the fiercest legislative battles in the recent history of the state.

• **Changes sought**—Two of the four proposed amendments were submitted by general contractors. These were more or less duplicates—reflecting apparent lack of liaison throughout the state. Both proposals sought to put general contractors on a more "fair and equitable" basis in bidding by further defining what should go into Items 1 and 2.

(There are five principal general contractor groups in Massachusetts, centering in the Boston area: the Master Builders Association, the Massachusetts Building Congress, two chapters of the Associated General Contractors of America, and the Building Trades Employers Association.)

A third bill was sponsored by the AFL Building and Construction Trades Council. Its principal aim was to eliminate jurisdictional squabbles that were resulting from the selection of contractors and subcontractors. It sought to further define the "lowest responsible eligible bidder" as one "who is able to furnish labor that can work in harmony with all other elements of labor employed on the work or to be employed on the work by other contractors and sub-contractors." The council felt that every job should be all-union—or it should be all non-union.

The fourth bill packed the real dynamite. It was sponsored by the young (three years old) and powerful (3,000 members) Associated Independent Subcontractors of Massachusetts. It called for complete separation of contracts—with the awarding authority making awards to the lowest repsonsible general contractor on the basis of Item 1 bids, and to the lowest responsible eligible subcontractors in each class of work under Item 2.

It specified a minimum list of subcontractors to be included in all contracts (instead of leaving that to the discretion of the awarding authority as is provided under the present law). In addition, it specified that subcontractors would be paid concurrently with the work done, instead of after completion of the general contract.

• **Battle rages**—With general contractors, subcontractors, and building trades all participating, the fight was soon roaring. Pamphlets and leaflets were distributed by the thousands. Corridors of the State House were jammed when hearings were held. From newspaper publicity to parliamentary maneuvering in the legislature, it developed into a no-hold-barred contest.

The general contractors' bills were lost in committee. Part of labor's bill was combined with the subcontractors' bills and found its way onto the floor of the Senate. It was defeated. There is no guarantee that another Donnybrook Fair may not occur at the next session of the legislature, but the air has been cleared. Labor will try again with its bill, modified to steer clear of the controversy between generals and subs. Neither the general contractors nor the subcontractors will oppose it. With a little push, it should go through.

Both the general contractors and the subcontractors are watching each other like hawks. If one moves, the other will make a countermove. If neither moves, another conflict may be avoided. There are good indications that both are trying harder to make the present law work; administrative changes are being made in order to offset some of the important objections.

• Legal problems

More rough edges are being knocked off Chapter 149 of the general laws by court decision. The most notable case in point involved construction of the Chronic Diseases Hospital and Nurses Home in Boston (ENR Apr. 24, p. 136).

In October last year, John Bowen Co., Inc., was awarded the work by the Department of Public Health with approval of the Massachusetts Building Commission, on a low total bid of $11,179,526.25. Second low bidder was J. Slotnik Co., with a total low bid of $11,179,685. Bowen was high on Item 1, but low on Item 2, and low on the total.

When the subcontractors' bids were opened, two discrepancies were found. Bowen had carried a painting subcontractor's bid at $20,000 less than Slotnik, and had included the item instead as a part of Item 1. And Bowen did not carry cost of a performance bond for the marble and tile subcontractors, while Slotnik did. If Slotnik had not carried the performance bond on the marble and tile subcontractors, he would have been low bidder.

The Supreme Judicial Court held that the award to Bowen was in error. It did establish that precautions should be taken to put the general contractors on a "fair and equitable" bidding basis:

1—Sub-bids, as filed, cannot be changed. A sub-bid must have an identical meaning for all general contractors.

2—The general contractor is not empowered to waive a performance bond on behalf of an awarding authority. The awarding authority alone has this power.

• **Ramifications**—As a result of the court decision, Bowen was paid for the work he had already done, and the rest of the job was rebid. New bids were opened Sept. 12, and Bowen was low bidder again—this time on a bid of $11,380,000.30 against Slotnik's $11,786,000.30, which was second low.

Last week, after nearly a year of delay, during which the job made no progress, Bowen was back to complete the job. During that time prices had risen, and losses resulting from the delay have been estimated up to $1 million.

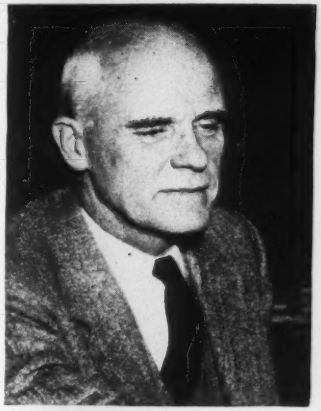
While this case is the biggest test of the law to come along yet, others are in the offing. Last month White Construction Co. of Boston sought an injunction against the city of Beverly over an award to Volpe Construction Co. for construction of a junior high school on a bid of $1,802,496. White, who was second low bidder with $1,839,000, claims the awarding authority did not comply with the law requiring that general contractors be supplied with the names of all the subcontractor bidders two days before opening of the generals' bids; and therefore White was not on a fair and equitable bidding basis with Volpe.

These and other cases are shaping Chapter 149—but they are a long and expensive way to do it.

• Administration changes

Amid the turmoil of legislative battles and court suits, the law is experiencing some quieter and more subtle changes at the state level.

While state agencies hold awarding authority for construction of public buildings, all plans and awards must clear through the Massachusetts Public Building Commission, which is an autonomous agency operating under the governor and council. It has general supervision over the state development program, from scheduling of projects through awarding of contracts—a volume of between $20 million and $25 million annually.



HALL NICHOLS, executive director of the Massachusetts Public Building Commission, is working out a compromise.

So Hall Nichols, executive director of the commission, has a lot of room to interpret the administration of Chapter 149. Operating within the scope of the law and its intent, he judiciously eliminates many of the problems that have arisen by regulatory requirements.

Nichols is a graduate of Harvard and of Massachusetts Institute of Technology. He was in the Corps of Engineers in World War I, then went into building construction, serving with the Aberthaw Co. and the Morgan Tuttle Co. of Boston. In 1933 he became secretary of the Massachusetts Emergency Public Works Commission, and executive director of the Public Building Commission which replaced it in 1947.

Nichols has earned the respect of both general contractors and subs for his fairness in handling their differences. In practice, most of the complaints have come from the subs—and much of Nichols' activity has been directed toward answering them.

From his long and intimate acquaintance with Chapter 149, he is convinced that while the practice of bid shopping is by no means general, the law to prevent it is necessary to avoid abuse by a minority. He also believes it is costing nothing extra and perhaps it is saving money.

Mr. Nichols says: "It is my opinion that where registered sub-bids are required, sub-bidders usually, in the first instance, will submit a bid which represents their true evaluation of the work. If registered sub-bids are not required, sub-bidders probably will submit an artificial bid in the expectation that the general contractor will try 'shopping' bids before awarding a sub-contract. I believe, therefore, that where registered sub-bids are called for, the sub-contract price for the work is more likely to be the true value, and that the elimination of 'shopping' results in better relationships on the work, and better workmanship."

• **Meeting the criticisms**—Robert La Centra, Jr., plumbing and heating contractor, who is the main sparkplug of the Associated Independent Subcontractors, agrees that the law has eliminated bid shopping "99½%."

Nichols watched closely the changes La Centra's group tried to put through the legislature, and drew some lessons.

The subcontractors claimed the intent of the law was being bypassed where the awarding authority did not specify enough subcontractors.

To clear this up at the state level, Nichols published a bulletin in June this year specifying that on state work 16 basic classifications of work were to be listed for sub-bids.

Subcontractors complained that they were not always being paid promptly after completion of their work, but rather when the project was completed.

Nichols included a clause in state construction contracts providing that payment to subcontractors will be made "not less than 65 days nor more than 75 days" after their portion of the work is completed.

The subcontractors wanted their bids awarded on the basis of the low sub-bid, instead of permitting the low general contractor to pick the subs.

Nichols has used diplomacy to solve that one. He does not believe in separate contracts, and nothing obliges the low-bidding general to use the low sub-bidder. But in most cases, Hall Nichols points out, the low general carries the low subs. Where he has not, Hall has found that in most cases the general is willing to make a substitution of the low sub—and the difference is saved by the commonwealth.

"On the whole the law is working out pretty well just as it is. Until industry itself can get together on improvements, it had better be left alone."

The final article on this subject, next week, will report efforts of Massachusetts to cut red tape in operation of the law.

BIG BELT CONVEYOR supplements rail hopper cars on one pier at Baltimore.

Belt conveyors double capacity of ore-handling pier at Baltimore

Belt conveyors having a total length of 1,600 ft have been added to the ore-handling facilities of the unloading pier of the Canton R.R. in the harbor at Baltimore as part of a program to double the capacity of that pier. This change has been made necessary by a large increase in movements of iron ore, manganese and chrome coming into this country through the port of Baltimore. The Canton R.R. serves all three rail carriers entering the port, the Baltimore & Ohio, Pennsylvania, and Western Maryland.

Heretofore, two ship-unloading cranes on the Canton pier, capable of handling 1,000 tons of ore an hour, discharged directly into hopper cars on four tracks on the pier. This arrangement did not permit the cranes to operate at full capacity while cars were being switched and spotted under conveyors. To permit the unloading cranes to operate continuously, a 48-in. wide belt conveyor has been added to the pier, running parallel to the railroad tracks. The belt conveyor went into service this week.

When cars are not available, the unloaders discharge ore onto the pier belt conveyor, which feeds an inclined belt back of the pier that discharges the ore to hoppers served by other tracks in the service yard.

Included in the present modernization program is a third ship unloader of 1,000 tons capacity, bringing the total capacity to 3,000 tons an hour. Also included in the program is the addition of five miles of track to the supporting yard to increase its capacity by 500 cars.

The conveyor system was designed and installed by the Robins Engineers Division of Hewitt-Robins, Inc., Stamford, Conn.

BLS sees no drop in housing next year

Housing construction activity in 1953 will continue at its record rate of the last two years, predicts the Bureau of Labor Statistics. In a speech to the 30th annual Agricultural Outlook Conference in Washington last week, Walter W. Schneider, acting chief of the Division of Construction Statistics, BLS, presented a detailed analysis of the housing demand and construction situation. He pointed out that civilian types of light construction and housing have suffered little from the defense efforts, and cited consumer demand, high levels of savings, adequate material supplies, and cheap insured credit as chief reasons for the continued impressive level of housing construction.

"If builders now aim for the huge mass market as they did in 1950, an especially good housing year is practically assured for 1953," Schneider said.

This year is the third in which construction activity as a whole has been at record levels, he said, and construction of all sorts, including public, probably will continue at the same high pace. Home construction accounted for about a third of all construction in 1952, almost as much as all public construction together, including the Savannah River, Paducah, and many other defense projects.

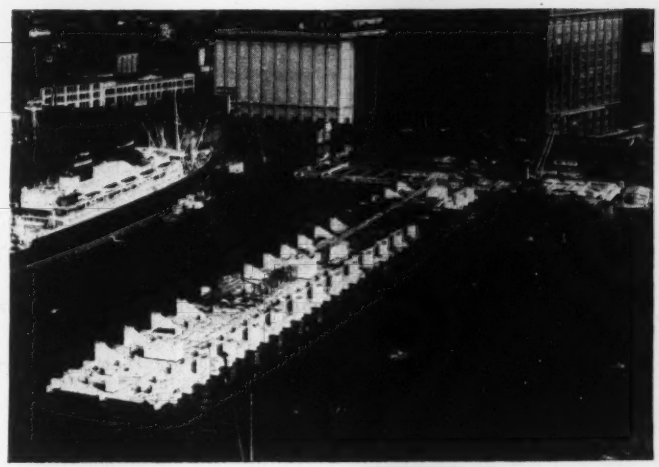
Schneider confined his remarks to non-farm housing, saying that it accounted for approximately 10 times the dollar volume of farm housing in recent years.

• **Pressures continue**—Dealing with the population influences on housing demand and construction, Schneider showed that over seven million dwelling units have been started since the end of the war, while the net gain of households was about 8 million, some of which did not constitute demands for new houses or apartments. Use of old structures and subdivision of existing dwellings have accounted for about a million units in the postwar years. This means that postwar construction and conversion has just about kept up with gross population increase. Other factors, however, enter to constitute a large housing demand. There was a large deficit in housing carried over from the war period, when construction was practically at a standstill. In addition there will be a million or so marriages in 1953, creating more pressure for housing to accommodate the new couples.

Five points were listed as population factors that affect housing: (1) high levels of employment, permitting single women to set up their own households, (2) birth of the third and fourth children now make early postwar homes too small for those families which bought or rented houses or apartments soon after the war, (3) the marriage spurt in 1950, caused by the Korean war, has brought about an increase in birth rate, which will force many families to seek homes in 1953, (4) migration trends in the last decade, from East to West, from South to North, and from farm to city, have sharpened the housing demand in certain areas, and (5) the wholesale migration into certain areas brought about during the recent defense period by installation of defense industry or military installations.

• **Indications for big year**—Schneider told the conference that 1953 would be a good year for housing starts if the purchasing power of the consumers continued to be good.

Despite Federal Reserve Board findings that liquid assets of consumers declined somewhat in 1952, BLS finds that about as many expect to buy in 1953 as did in 1952. Furthermore, incomes have continued to rise, employment is at record levels, defense expenditures will continue to rise at least until some time next year, and materials and construction costs are about the same as they were in 1950, the unit cost per man for construction even indicating a definite trend to decline.



THREE CONCRETE BOXES that make up the substructure for Pier 57, Hudson River, New York City, are lined up to form a T.

Pier 57's girders are being cast

Use of an unusual cantilever form for casting the heavy transverse concrete girders on the concrete substructure boxes of Pier 57, Hudson River, New York City, is speeding construction (ENR July 31, p. 36).

With winter imminent, Leonard Ott, project manager for the joint firm of Merritt-Chapman & Scott Corp. and Corbetta Construction Co., Inc., is pushing construction of the 38 transverse girders that will support the deck slab.

The ingenious form permits the girders—146 ft long, 11 ft deep, and 2 ft wide—to be produced at a one-a-day rate.

The girders cantilever out 33 ft from the sides of the concrete boxes. Supporting the cantilever section of the form is a timber Y. The stem of Y rests on the bottom slab of the box where it forms a shelf 20 in. thick extending 23.5 ft beyond the sides of the box. The form itself cantilevers about 19 ft past the support.

The material used for the form is oiled plywood. Seven sets of these forms are being used on a schedule that takes advantage of the two-day week-end for setting time.

• **Bringing down the boxes**—The last of the three 360-ft long concrete boxes was towed down from its Grassy Point, N. Y. production center early in the month. As soon as it was in position work was begun.

It took three months to get the three boxes of concrete down from the Hudson River lake-bed drydock where they were produced.

The first—and smallest—concrete box, 367 ft long, 80 ft wide, and 26 ft deep, was brought down in a faster-than-expected trip late in July under a six-tug tow (ENR Aug. 7, p. 26).

The second box 360 ft long, 82 ft wide, and 34 ft deep was towed down in the middle of September. The draft (28 ft) of this box made crossing a bar in the Haverstraw Bay area of the Hudson River a ticklish project. However, catching the highest tide and forcing the box past the bar by steady towing, got it over. Although mud trails showed behind the box at times, because it tended to leave the river channel, it was at its approximate position ahead of schedule.

The third, and last, of the boxes, identical in size with the second box, was towed down the river early in October. Using the accumulated experience of the first two jobs, the last box was hiked over the Haverstraw bar and towed down the river without raising mud from the river bottom.

• **Position the stem**—The last two boxes form the stem of the T-shape pier substructure. When filled with fresh water and sunk in place, they will rest on a specially prepared sand and gravel bed laid down by O'Brien Bros., Inc., and Quist Construction Co., Inc., as a joint venture last year.

To position the two outshore boxes, the joint firm of Merritt-Chapman & Scott Corp. and Corbetta Construction Co., Inc., had driven pile clusters in two rows from the shoreline to the pierhead line. Wire cables from these dolphins to the two boxes warped them into position.

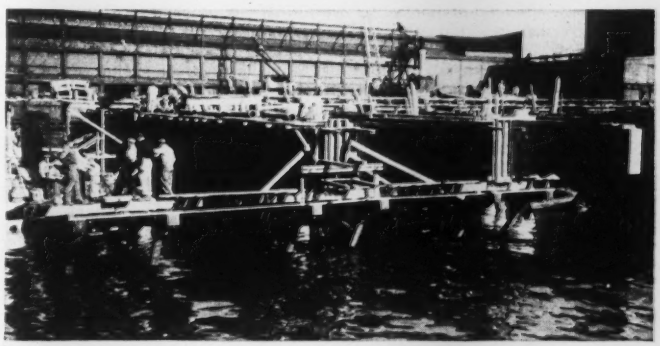
The tricky problem now is to hold the boxes evenly so that they remain in position—or within ½ in. of position—while they sink under the weight of fresh water pumped into them.

• **Sinking the boxes**—The water load in the boxes will be equal to the fully loaded pier. Thus, the substructure, loaded with water, will prestress the foundation bed fully.

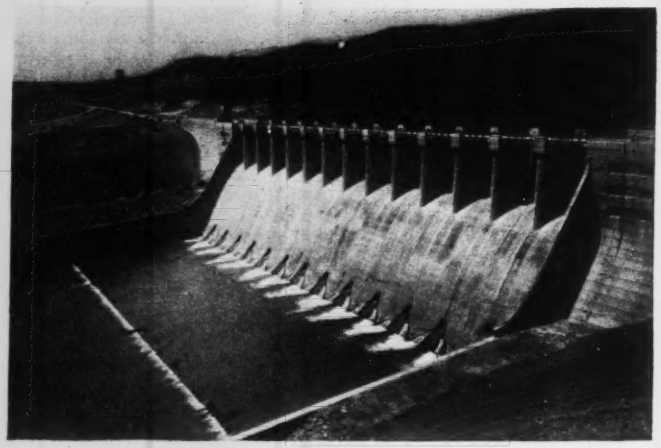
The boxes are expected to compress the foundation bed one-foot, according to the calculations of the designer, E. H. Praeger of Madigan-Hyland, consulting engineers.

The load will be maintained constant by pumping water out of the boxes as the superstructure is erected.

The design of the pier substructure has allowed for some leeway should the soil calculations prove faulty. The designer and the engineers on the job are prepared to alter the slope of the ramp from the shoreline Box No. 1 to Box No. 2 to fit the actual elevation after the boxes have stabilized and compressed the subsoil and foundation bed.



CANTILEVER FORMS for the transverse girders that cantilever out 33 ft from the sides of boxes Nos. 1 and 2.



CONEMAUGH DAM is expected to convert flood plains to industrial sites.

Conemaugh Dam will restrain floods

Forging of another link in the chain of flood control dams in the upper Allegheny region was nearly finished this week. Conemaugh River Dam (ENR Feb. 14 p. 148) in the upper Allegheny River Valley was scheduled to be ready for operation Nov. 1, when 13 sluice gates will be finished to the point that they can be closed, should water levels of the Conemaugh and Allegheny Rivers make it necessary.

The Army Engineer dam is part of a flood protection plan for Pittsburgh and the upper Ohio Valley.

Conemaugh Dam is about 31 miles from the site of the ill-fated South Fork Dam above Johnstown, an earth-fill dam 76 ft high, built without engineering supervision, which on June 1, 1889, failed by overtopping, causing the worst flood disaster in U.S. history. It resulted in the death of more than 2,200 persons and property damage of many millions of dollars.

The new dam will impound temporarily flood waters arising from a 1,351-mi drainage area, and will release the waters gradually when downriver channels can accommodate them.

Completion of the structure can have an important secondary effect for Pittsburgh and neighboring communities: an expansion in industrial construction during the next decade, because the flood control system will make available desirable plant sites on what had previously been lowlands subject to floods. The six dams already completed are expected to cut about 5.5 ft from the crest of future floods, and the Conemaugh Dam is counted on to cut off another 4.6 ft.

Savin Construction Corp., of East Hartford, Conn., was contractor for the dam. Cost of the project was $44 million, with $9 million spent for the dam and the rest for land acquisition and rail and highway relocation. Relocation of 21 mi of railroad and 11 mi of highway was necessary. This work was done by a combine of Hunkin-Conkey Construction Co.; Shoffner, Gordon and Hinman, and Herman Holmes Construction Co. A 3,000-ft tunnel was made by the Holmes firm in its section of the rail relocation.

Conemaugh Dam data

Maximum height	170 ft	Minimum storage	4,000 acre-ft
Total length	1,290 ft	Surface (full)	6,820 acres
Spillway length	420 ft	Concrete	333,600 cu yd
Crest gates (14)	30 x 30 ft	Rock excavation	150,000 cu yd
Sluices (13)	5.67 x 10 ft	Earth excavation	130,000 cu yd
Maximum storage	274,000 acre-ft		

Government scramble on public works scored

The competition among federal agencies for authority to do work in the same field—such as public works—creates a problem both for Congress and the state and municipal areas involved. That was the heart of testimony by Charles D. Curran, staff director to the House Public Works Subcommittee on Civil Works before the Texas Water Conservation Assn., in Mineral Wells, Tex., last week.

Curran told the group that Congress didn't have the technical background to decide whether the Dept. of Agriculture, for instance, or the Corps of Engineers should be given a certain flood control project.

He pointed out that definite agency responsibility has been fixed for federal-state cooperation in the federal-aid highway and water pollution abatement programs. He felt the executive branch should do the same thing for other programs by resolving jurisdictional claims among federal agencies.

In light of the fact that the subcommittee has not yet reported its findings in its study of civil works projects, Mr. Curran's remarks took an added significance.

He pointed out that the committee has heard testimony from the Corps of Engineers, Interior Dept., Agriculture Dept., Bureau of Reclamation, Federal Power Commission, TVA, and the International Boundary Commissions for both Mexico and Canada. He said that one of the objectives of the hearings was to define what in agriculture is flood control from the public works standpoint and what is not flood control but land improvement.

• **Outlines problem**—"During the past year," he said, "ten reports of the Dept. of Agriculture made under authority of flood control law have been referred to the Public Works Committee. Each of these proposes a program consisting of land management improvement and of certain capital investments in the nature of structures in upstream areas. While these are called flood control programs, flood control benefits vary from less than 3% to approximately 25% of the total benefits."

In most of the projects the Corps of Engineers had raised questions of technical soundness, he pointed out, and the Bureau of the Budget had failed to give full endorsement.

The result was that "a committee of Congress composed of legislators and not of qualified professional engineers is called on to resolve technical questions raised by two agencies of the executive branch of government."

Union shop can be revoked by election

A union-shop clause in a labor contract is good only so long as the employees do not vote to eliminate it; it is not binding for the duration of the contract.

This new interpretation of the Taft-Hartley law's restrictions on union-shop contracts has been handed down by the National Labor Relations Board. It is bound to come up in discussion of revision of the labor law by Congress next year.

Although this decision is not based on a construction trades case, it certainly can apply to construction unions. This is especially so since the NLRB has shown more acceptance of the principle of representation elections for construction firms (see article headed "NLRB orders two elections," in this section).

The decision, by a split 3-2 vote, establishes a significant precedent in labor-contract making:

The right of a union to sign a union-shop contract under Taft-Hartley is only conditional, and subject to revocation at any future time by a vote of the employees. Ordinarily, a contract is a contract and its provisions apply for the term of the contract.

In this case, NLRB granted a union-shop decertification election requested by a group of employees in a Great Atlantic & Pacific Tea Co. bakery in New York City. The Board rejected the argument of A&P and the AFL Bakery Workers' Union that their two-year contract covering these workers does not expire until next year.

• **Dispute**—In dispute was the interpretation and effect of the 1951 amendments to the Taft-Hartley law, abolishing the old mandatory union-shop authorization election.

Until last year, the law provided that unions had to have approval by a majority of employees before negotiating union-security clauses.

But voting results in the four-year period showed that employee authorization was automatic in a vast majority of cases. As a result, Congress in 1951 eliminated the expensive, seemingly pointless procedure. But Congress retained a provision in the law permitting employees to withdraw their approval—in effect, to get out of a union shop through an NLRB election.

However, Taft-Hartley does not specifically define what effect a vote-withdrawing authorization has on an existing union-security agreement.

A&P and the union contended before the Board that, even if their two-year contract did not bar the poll, the results should not take effect until the contract expired. They interpreted the 1951 amendments as limiting the effect of withdrawal of union-shop authorization only to extensions or renewals of such agreements.

But Chairman Paul Herzog, and Members John Houston and Ivar Peterson, said:

"Only by holding that an affirmative deauthorization vote immediately relieves employees of the obligations imposed by an existing union security agreement can this Board give effect to the basic congressional objective of not imposing a union-security agreement upon an unwilling majority."

A lengthy dissent by Member Abe Murdock and Paul Styles charged the majority members with "legislating where Congress deliberately did not." The dissenters said the Board's ruling would "critically injure the stability of bargaining relationships."

The majority assumed that since the A&P employees had never approved a union shop, the union's authority to have it existed on a conditional basis only."

NLRB orders two elections in new industry trend

Representation elections among employees of two construction companies will be conducted by the National Labor Relations Board as a result of two orders by the Board last week.

The action apparently is in line with a recent trend to grant such elections. In the past, the Board has been reluctant to undertake bargaining elections in construction because of the turnover of men and crafts on a project.

One election will decide whether the AFL carpenters and joiners will bargain for a unit of carpenters and millwrights employed by the Sanderson and Porter Construction Co. at a large-scale power station project in Albright, W. Va.

The company asked the Board to dismiss the carpenters' request for an election because the particular job now under construction will be completed by the end of the year.

But the Board said the election was appropriate because a representative segment of carpenters and millwrights will be employed for the rest of the year and re-employed early in 1953 for a year and a half on another section of the Albright project.

The second election will be held in Puerto Rico. There the Puerto Rico Free Federation of Labor seeks a unit of all construction and maintenance workers at a project, including regular employees as well as those hired only for the duration of the project.

The Antonsanti Construction Co. wanted the unit to include only those workers hired locally for the project. But the board ruled that all employees had the same working conditions and supervision. The project runs through the middle of 1953.

Time-off for election

The Wage Stabilization Board has approved time off, without loss of pay, for voting in the general election. Until the Board had made this exemption from wage control laws, an employer who gave workers a holiday or time off to vote, without loss of pay, might have found himself in violation of wage control law, if this was not his customary practice. It would be tantamount to giving the worker an unauthorized raise in wages—allowing him to be off without loss of pay.

Evendale jet engine plant shut down by union dispute

About 2,000 AFL building trades workers did not report to General Electric's Evendale, Ohio, jet engine plant late last week because of a jurisdictional dispute.

The walkout apparently came because of a long-smoldering dispute with GE over its use of maintenance employees for certain work on the construction project. The walkout shut down the $5-million project without the use of pickets.

Frank Vincent, secretary and business representative of the Building Trades Council, said that representatives of the 19 building trades unions met with GE management and told them of their grievances. After company officials refused to agree to halt the practices, the business agents called the walkout.

A company spokesman said that the union complaint was vague. "They said only that they wanted to do work

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in buildings where we now have our own employees working," the spokesman stated.

The spokesman added that regular GE employees are only used on inside work to put a building in readiness for use.

At week's end, no attempt to meet to settle the dispute had been arranged.

Industry told to clean house on safety

There are three basic reasons why the construction industry must step up the tempo of its accident-prevention programs. They are: to give the worker better protection from the standpoint of humanitarianism; more profit for the contractor through decreased insurance rates; and to reduce the threat of federal legislation designed to safeguard the construction worker.

This triple-barreled blast at the high accident rates on construction was spelled out in detail by Robert M. Hoover, president of the Kansas City Bridge Co., at the 40th National Safety Congress held last week in Chicago.

Hoover warned the 200 delegates attending the two-day meeting of the National Safety Council's Construction Section that the construction industry must have a safety house-cleaning.

"We can do it ourselves, better and more efficiently, than to have it done under legislative rules and regulations," Hoover said.

Hoover said: "The unfortunate labeling of the industry as highly hazardous cannot long endure without attracting the attention of legislators. In fact, action has already been started in the form of various bills in Congress."

• **What can be done**—As if in answer to Hoover's plea for a safety house-cleaning by the construction industry, J. A. DeLuca, Construction Division Safety Superintendent, E. I. du Pont de Nemours & Co., outlined several of the cardinal points necessary for good safety.

They include: qualified safety personnel, adequately paid; properly run safety organizations; effective liaison with safety equipment manufacturers prior to starting construction; insistence on early and prompt delivery of safety equipment; more effective safety meetings, each planned to hit a mark and get a definite result; and a detailed advance analysis of insurance ratings for each construction job undertaken.

The safety engineer's responsibility is also increasing, said DeLuca and he must apply good business methods to his operations, based on sensible procedures and practical rules. When a crippling accident occurs, he should get a specific diagnosis from the doctor. He must coordinate closely with his company's legal department. And his accident reports must be prepared in such form that top management can, and will, read them and understand what they mean.

• **Top management's role**—Top management, itself, is to blame for the high accident rate in many construction companies, declared Dale Medsker, area superintendent for the Safety Engineering Division, National Surety Corp., Atlanta, Ga. This fact was brought out in a recent survey of southern construction managements, which produced over 2,000 suggestions as to the causes of accidents and how to reduce their number and frequency.

Of the 24 accident causes developed by the survey, 17 were charged to management's failure in one form or another. Of 21 suggested corrective measures, 16 were laid directly at the feet of management's desire and ability to initiate effective accident control measures.

The survey—which was conducted by Medsker's office—showed that management contends the lack of adequate and efficient on-the-job supervision is the greatest of accident causes. In second place is the employment of inexperienced and untrained workmen.

• **Other causes**—Other major causes of accidents on construction—in order of their importance—are: careless and negligent actions by employees; rushing the job (superintendents and foremen taking obvious chances); use of defective, improper or inadequate equipment; failure to give definite safety instructions; and poor housekeeping around the job, leaving debris and pitfalls open for accidents.

At the close of the two-day construction-safety session, H. B. Alexander, president of H. B. Alexander & Sons Inc., Harrisburg, Pa., was named general chairman of the Construction Section of the National Safety Council, for 1953. He succeeds Harold W. Richardson, editor, Construction Methods and Equipment, New York City.

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PROJECT: Pumping plant to augment supply to Delaware Aqueduct from Hudson River.
CAPACITY: 100 million gallons a day to be supplied by 5 pumps. Sixth pump for standby use rated at same capacity, namely 14,000 gpm.
LIFT: Rated head 575 ft. but suitable for efficient operation for heads between 525 and 625 ft.
MOTORS: Six 2500 hp motors @ 900 rpm; 3 phase, 60 cycle at 4,000 volts.
PERFORMANCE: Overall efficiency required 75%. Pumps tested exceeded requirements, giving overall efficiency from 83.4% to 87.7%.
PUMPS: 6 Peerless close-coupled vertical turbine type; 5 stages, 36" diameter bowls. Discharge size: 24".
PURCHASER: Board of Water Supply, City of New York.
GENERAL CONTRACTORS: Tuller Construction Co.; A. S. Dillenbeck.

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"PARTLY PRESTRESSED" BEAMS for a transfer-shed roof cost less than an alternative design. (British Railways photo)

How to lower prestressing costs

P. W. Abeles
Consulting Engineer
London, England

IF PRESTRESSED BEAMS are designed to permit tensile stresses in the concrete under working loads, construction costs can be cut with no decrease in safety. Such "partly prestressed" beams make possible savings in concrete, steel, formwork, prestressing anchorages and labor. Tests have proved the soundness of this new type of construction, and experience with bridges and buildings in various parts of England has demonstrated its economy.

Whether or not tensile stresses occur in the flanges of prestressed beams is determined by the amount of prestressing force applied to the beams. If desired, the concrete may be kept in compression by the prestress under all conditions of loading, up to the point of failure. Or, the prestress may be so slight as merely to insure closing of cracks on removal of the load.

• **Prestressed building**—One example of this new type of construction is a 200x80-ft transfer shed now being built for the British Railways, Eastern Region, at Bury St. Edmunds, Suffolk. The roof framing consists of "partly prestressed" precast beams, bottom flanges of which will have a maximum tensile stress of 650 psi under dead plus live load (modulus of rupture of the concrete is about 800 psi). This construction was selected after a cost comparison of preliminary designs indicated that partial prestressing would be cheaper than structural steel.

Bays are 40x76 ft. Roof beams of prestressed, precast concrete span the 76 ft and are spaced 20 ft apart. I-shape in cross section, they are 48 in. deep at midspan, 17 in. at the ends. Webs are 5 in. thick and flanges are 6x18 in. Cube strength of the concrete was 6,200 psi after 5 days.

Prestress was applied with two straight cables of spaced wires and one slightly curved cable, the wires in each cable being anchored in pairs at the ends of the beams. After the wires were anchored, grout was injected to bond the cables. In addition, in the bottom flange of each beam, nine pairs of 0.2-in. dia wires were incorporated without being prestressed.

At 6-ft intervals these beams support partly prestressed factory-made purlins, which carry an asbestos-cement roof. Under this dead load, there is only compression in the flanges of the 76-ft beams. When maximum live load is superimposed, tensile stresses occur; but the tension does not exceed 650 psi, which is less than the modulus of rupture of the concrete. Under ultimate load, the high-strength tensioned and untensioned wires in the bottom flanges are capable of carrying the entire tensile force, as do the steel bars in ordinary reinforced concrete. This design permitted much smaller beams to be used than if no tensile stresses were allowed under working loads.

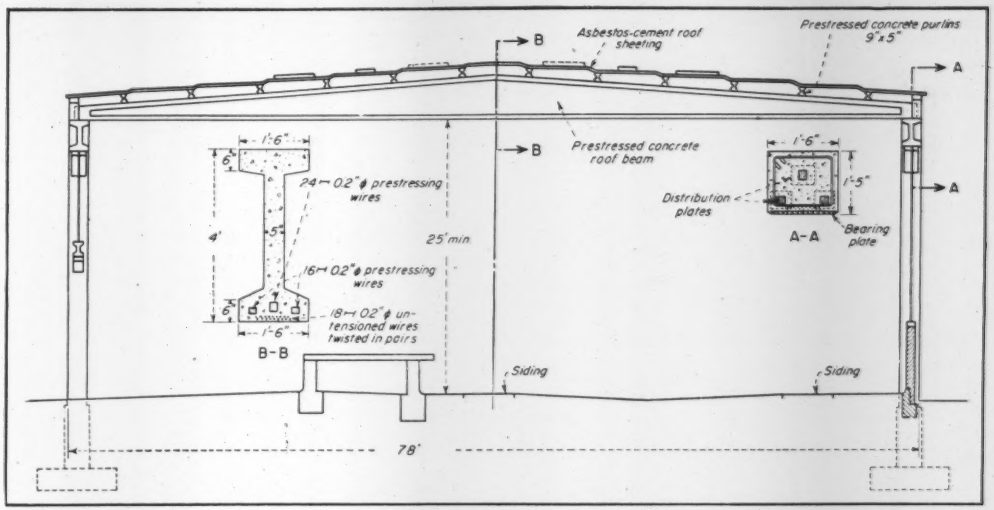
The reason smaller beams can be used, as will be explained in detail later on, is that for tension to be entirely eliminated under working loads, higher precompression stresses must be introduced. These require a greater section modulus.

Alternate beams are supported at the midpoint of 38-ft long partly prestressed, factory-made spandrel girders. I-shape in section, with a 5-in. web and 4x21-in. flanges, these girders are 32 in. deep. They were prestressed with sixty-five 0.2-in. dia wires in the bottom flange and sixteen in the top. Wires are bonded to the concrete without end anchorage.

Though tension is permitted in the concrete, the prestress is relatively heavy in the spandrel girders to avoid formation of cracks in the edges under combined maximum vertical and horizontal loading. It would have been more economical and practicable, however, to permit much higher tensile stresses under such unusual combined loading, even with the possibility that temporary cracks might develop at the edge.

On the other hand, a conventional I-shape beam would have had to be much heavier and the prestressing forces would have had to be greater; thus, costs would have been appreciably higher.

Principal contractors for the transfer shed are C. R. Price, Doncaster, who built the roof beams, and Anglian



TRANSFER-SHED FRAMING consists of concrete columns and precast roof beams with both tensioned and untensioned wires.

Building Products Ltd, Lenwade, who manufactured the spandrel girders and purlins. The design was prepared by British Railways, Eastern Region, under J. I. Campbell, civil engineer. The Railway Executive erected the members with its own cranes.

• **Effect of prestress**—As pointed out in a previous article ("How much prestress?" ENR July 5, 1951, p. 32), the behavior under load and the type of failure of prestressed beams is determined by the amount of prestressing force applied to the concrete. Beams that are fully prestressed (Type I) will not crack unless severely overloaded, sometimes not until on the verge of failure. Partly prestressed beams (Type II), with slightly less prestress, will not crack until the working load is exceeded to a certain extent. Moderately prestressed beams (Type III), with still less prestress, will not crack under dead load. And slightly prestressed beams (Type IV) may have harmless cracks under ordinary loading. But regardless of the amount of prestress, if beam cross sections are identical the ultimate load will be about the same for all four types.

Type I should be adopted for structures, such as water tanks, designed to hold liquids. It also is desirable for beams subjected to repeated heavy impacts to insure an adequate safety factor against cracking. For once cracks have occurred, continued impact may destroy the bond between steel and concrete. But, for most other classes of structures, Types II, III and IV are permissible and require less concrete and formwork, as well as offering other savings due to the smaller prestress. They have been used in England at lower cost than for designs in reinforced concrete, structural steel and Type I prestress.

• **Basic principles**—In brief, partial prestressing calls for the application to a concrete beam of a prestressing force of limited magnitude so that under maximum working load definite tensile stresses will be created in the concrete. (Type I prestress differs in that only compressive stresses occur in the concrete under loads up to and including the maximum working load.) The tensile stresses are computed for a nominal straight-line stress distribution over a homogeneous material, even though hair cracks may develop.

Two conditions may be set up to distinguish partial prestressing from full prestressing and from reinforced concrete. And a third condition differentiates between Types II, III and IV. These are:

Condition 1 – Under maximum working load, the maximum resultant tensile stress (bending stress plus effective prestress in the concrete) should be at least, say, 250 psi. This insures that stress in the concrete at the level of the steel will be compressive.

Condition 2—The total steel area should be so small that the nominal working-load stress in the steel calculated for a cracked section, as for ordinary reinforced concrete, and ignoring any tensioning stress, will be more than 50,000 psi, preferably more than 100,000 psi. The steel should be bonded to the concrete throughout its length. Also, it should have a tensile strength (or yield point, when one exists) double that of the working-load stress, making the safety factor against failure equal to two.

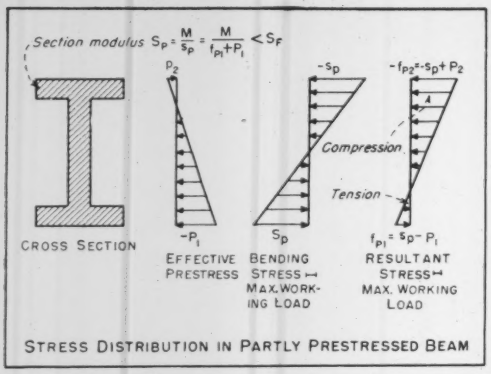
Condition 3—For Type II beams, the maximum tensile stress (bending stress plus effective prestress) in the concrete under the maximum design load should be less than the modulus of rupture, the difference between these two stresses depending on the frequency of occurrence of the working load (see ENR July 5, 1951, p. 32). For Type III beams, there should be no tension in the concrete due to bending under dead or permanent live loads.

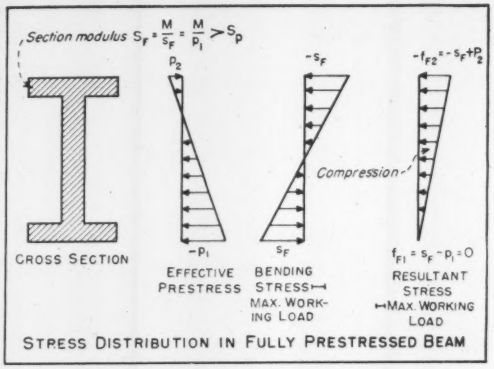
• **Untensioned steel added**—The required prestressing force can be computed from conditions 1 and 3. From this, the area of prestressing steel needed can be found.

Condition 2 determines the total area of steel required. Since this area in many cases is greater than that required for applying the prestress, the difference must be made up with untensioned steel, preferably of high strength.

Tests indicate that the untensioned steel (with diameters up to 0.276 in. with proper surface conditions) functions effectively right up to failure, if it is well bonded to the concrete. Even when the prestressing steel is not bonded to the concrete, use of bonded untensioned steel is beneficial; it increases the ultimate strength of the beam and improves crack distribution.

Condition 2 reduces the total steel area to an amount impossible with





CONCRETE BEAM partly prestressed (left) has low tension in bottom flange; fully prestressed beam (right) has no tension.

ordinary reinforced concrete. Stresses for reinforcing steel are limited to less than 30,000 psi, because of the size of cracks formed at higher stresses. Condition 2 steel area is also less than for a combination of tensioned wires and untensioned steel of a strength ordinarily specified for reinforced concrete, which was suggested in 1939 by the Austrian engineer Emperger.

• **Less materials needed**—For a given working-load bending moment and initial prestress, a beam of Type II, III or IV needs a smaller section modulus than Type I. Thus, a saving in concrete and formwork may be effected. Here's why:

With full prestress (Type I), for which the area of the tensioned steel generally is greater than that required for safety against failure, the required section modulus depends on the permissible maximum concrete stress at transfer (application of prestress). Suppose, for example, this stress is 2,000 psi. Assume also that maximum possible losses for creep and shrinkage of the concrete and relaxation of the steel total 25% of this stress. Then, a prestress of only 1,500 psi can be taken as effective in counteracting tensile stress when the section modulus is computed for the working-load bending moment. Thus, $S=M/1{,}500$.

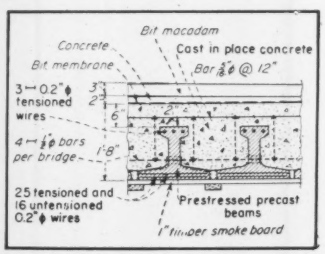
On the other hand, with Type II and III beams, tensile stresses of, say, 600 and 1,000 psi, respectively, may be permitted in the concrete, Type II insuring freedom from cracks and Type III allowing temporary very fine cracks to develop occasionally. Consequently, a smaller effective prestress is necessary. For Type II, the required section modulus is $M/(1{,}500+600)$, or 71% of that for Type I. For Type III, it is $M/(1{,}500+1{,}000)$, or 60% of that for Type I. This results in an appreciable saving in concrete and formwork.

The reduced area requires, however, a reduced prestressing force, and thus, a smaller anchorage suffices. The prestressing force needed can easily be computed from the permissible concrete stresses at transfer, as I have shown in my book ("Principles and Practice of Prestressed Concrete," Frederick Ungar Pub. Co., New York).

If the reduction of beam size is of less economical importance than a reduction of prestressing force; that is, if it is not necessary to decrease the depth of the section, then it is possible to reduce the prestressing force even further.

• **Prestressed bridges**—Although I suggested partial prestressing as long ago as 1940, it was not until 1949 that this concept was first applied. Two highway bridges were built near Barnsley, Yorkshire, over a railroad. Beams are Type II, but the untensioned steel consists of mild steel bars. Decks are of composite construction.

The precast beams, resembling steel railroad rails in cross section, were assembled with bottom flanges touching, and concrete was placed between and over these beams. Cost of an alternative deck construction, with concrete-encased steel joists, would have cost 65% more and required 5.25 times as much as steel.



SECTION through bridge deck with partly prestressed beams.

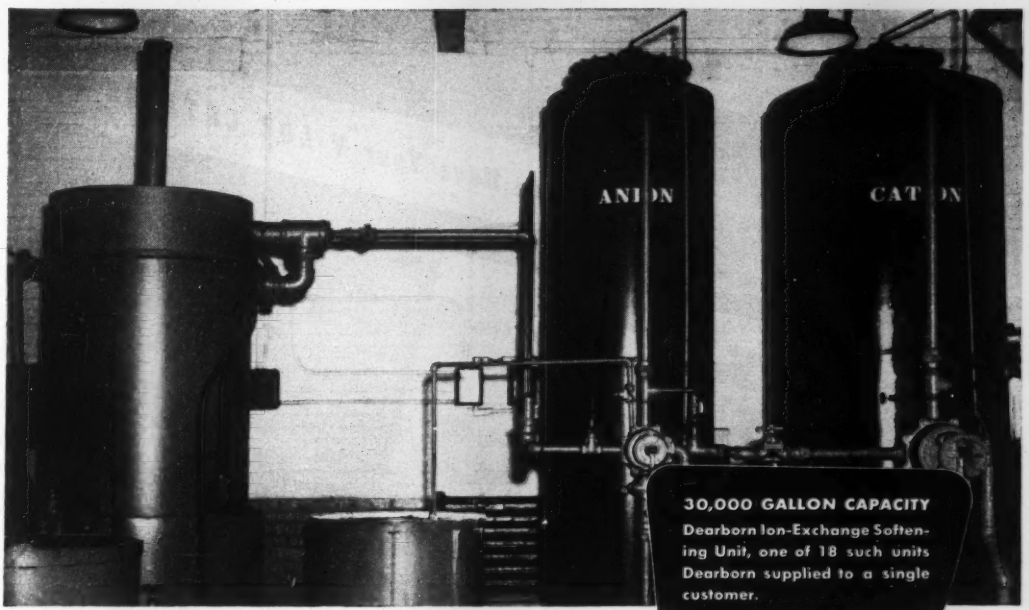
Since then, 14 bridges of an improved design, spanning 30 to 48 ft, have been built. The precast members in these contain both tensioned and untensioned wires with an ultimate strength of 224,000 psi. Precasting was carried out in long beds in a factory, the wires being bonded to the concrete. The tensioned wires were stretched between fixed abutments and cut loose to apply the prestress.

This design greatly simplified construction. The only reinforcing that had to be added at the site were a few transverse rods placed through holes in the beam webs and some distribution steel above the beams. No transverse prestressing was necessary, since the cast-in-place concrete insures adequate load distribution.

Under dead load, the bottom flanges of the precast beams are wholly in compression. Under maximum working loads, the tensile stress in the concrete flanges ranges between 500 and 600 psi, the modulus of rupture being 1,000 psi. Should overload open cracks, they would close up under dead load.

(Tests carried out on cracked beams under fatigue loading in 1951 at the University of Liege, Belgium, proved that fatigue loading is harmless if the wires are well bonded. They also indicated that if hair cracks occur and open under subsequent fatigue loading, they close completely when the load is removed. Details of these tests are given in "Some New Developments in Prestressed Concrete," by P. W. Abeles, THE STRUCTURAL ENGINEER, London, Oct., 1951.)

Partial prestressing has also been used with savings in construction costs for other types of structures. This experience verifies that beams of Types II and III not only have physical properties that are advantageous but also offer a considerable saving in material and labor and permit shallower beams than with fully prestressed or reinforced concrete construction.



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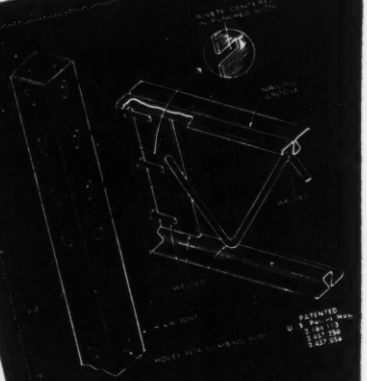

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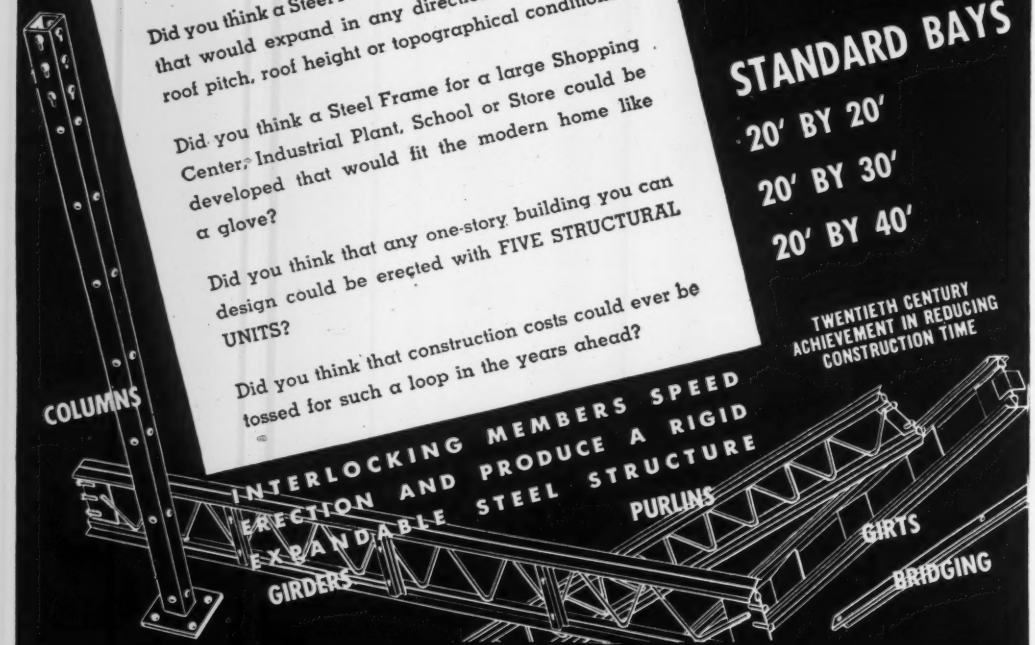

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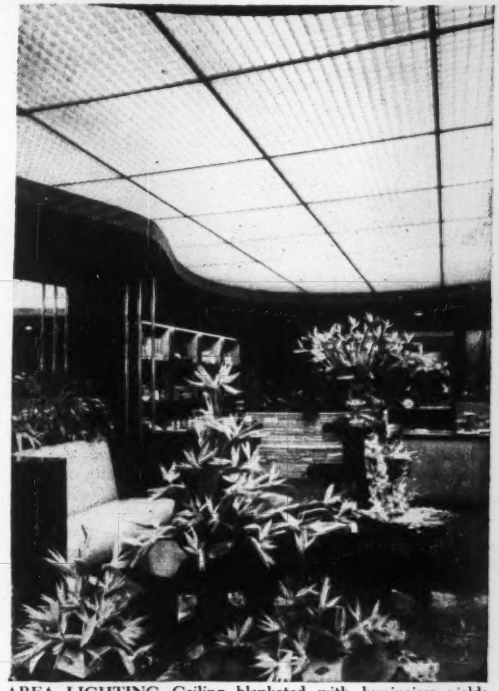
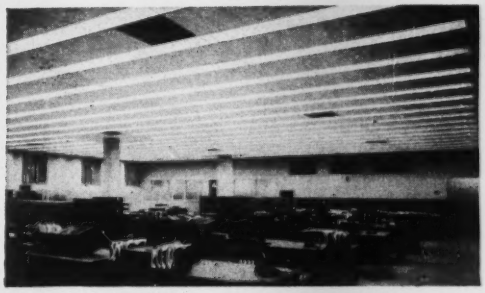


AREA LIGHTING—Ceiling blanketed with luminaires yields high light levels, low brightness. This is louvered type.



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Felix B. Graham
Engineer, Syska & Hennessy, Inc.
New York, N. Y.

THE INEXORABLE DEMAND for greater visual comfort eventually may force adoption of a standard illumination level as high as 100 foot-candles, compared with present norms in the neighborhood of 30 to 50 ft-c. The question arises, do we have the means to achieve this or higher illumination level economically?

An affirmative answer is indicated in the face of recent developments, the most noteworthy of which are: Area lighting, improved brightness control, better industrial lighting techniques and several new-type lamps.

• **Louvered ceilings**—Area lighting, in essence a large-area luminaire, takes in louvered, luminous and baffled ceilings. A louvered ceiling consists of closely spaced vertical metal or plastic strips connected by lightweight channels, in turn suspended from the structural ceiling by hanger rods. The light source may be either incandescent or fluorescent, although the latter is more popular. Reflectors may be used, or the lamps can be left bare. For uniform brightness, a definite ratio must be maintained between lamp spacing and distance from lamp to louver. Pipe, ducts, air outlets and structural members can be left bare above the louvers, but everything in this area should be painted white.

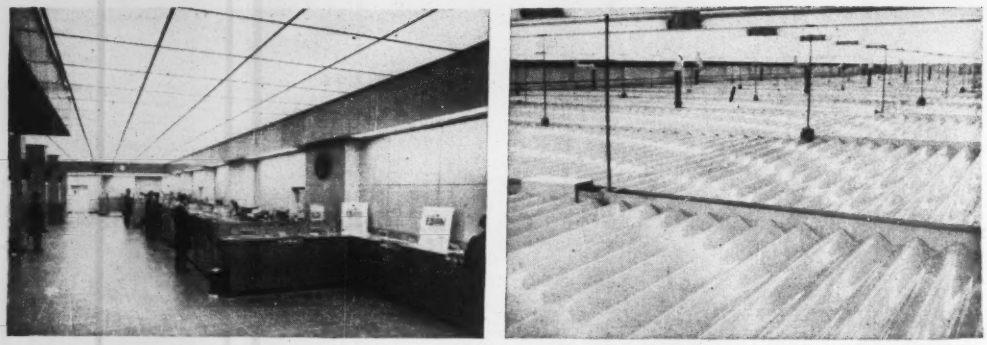
The louvers themselves can be of steel with a baked enamel finish, of low-brightness aluminum, or of vinyl plastic. Sagging, an early objection to the plastic, can be avoided by limiting the size of the sections and by joining them rigidly. The advantages of plastic are significant: light weight, easy maintenance, less chance of wavering patterns, and better appearance because of the substance's translucency.

While installation costs of a louvered ceiling (and of luminous and baffled types, also) are relatively high, it should be remembered that the need for a suspended ceiling is obviated. Louvered ceilings are especially suitable for large areas where high intensities and minimum brightness are required. For example, in a retail store the merchandise must be well-illuminated while the ceiling remains dim, so that the customer's attention is drawn where it should be.

• **Luminous ceilings**—Two valid objections to louvered ceilings stem from the underside being open. Reflections from bare lamps on shiny surfaces may be annoying, and the piping and ducts are exposed to view if one looks straight up. These objections may be overcome with a luminous ceiling. This consists basically of solid strips or panels of translucent plastic or glass, held in a framework similar to that for louvered ceilings.

Fluorescent lamps are fixed directly to the structural ceiling with wiring channels. Building services, such as sprinkler systems, piping and the like, are also housed in the space between the diffusers and structural ceiling.

The plastic panels may be flat or corrugated. One manufacturer produces 3-ft wide strips that can be rolled up like a window shade, making for easy lamp replacement and maintenance. This particular panel also rolls up automatically to expose



LUMINOUS CEILING may be common light source of the future. It consists of solid plastic strips held in framework suspended from structural ceiling. Space above diffusers (right) is ample for sprinklers and other piping runs.

sprinkler heads when a predetermined temperature is reached (about 20 F less than sprinkler set-off temperature).

Since both plastic and glass diffusers are not satisfactory as sound absorbers for some types of occupancy, luminous ceilings are often broken up by acoustical baffles suspended from the framework.

Intensities of more than 150 ft-c are attainable with luminous ceilings. A well-designed installation creates an effect similar to the natural sky. There are no shadows, reflection from shiny surfaces is minimized, and brightness is even and comfortable.

Luminous ceilings are becoming increasingly popular in offices, lobbies, museums and courtrooms. In the writer's opinion, they are destined to be the common light source of the future.

• **Baffled ceilings**—Another form of area lighting is the baffled ceiling, consisting of continuous rows of fluorescent lamps fixed to the structural ceiling and shielding baffles suspended in one or two directions. The baffles are of acoustical tile or translucent plastic.

This type of ceiling is most suitable where the direction of view is permanently established, as in classrooms. Rows of lamps are run at right angles to the view line. Several manufacturers furnish in unit packages all materials required for a complete installation.

• **Brightness control**—The demand for higher lighting intensities makes brightness control increasingly important. Several recent installations employ extra-deep single-lamp recessed troffers in continuous rows spaced on 3-ft centers for this purpose. The troffers are so deep they present little brightness when viewed crosswise and are barely distinguishable from the ceiling at a distance. Cross baffles limit brightness in the lengthwise direction (They may be omitted when low-brightness lamps are used).

Sufficient recessing space is sometimes a problem since deep troffers require 10½ in. compared with 6 to 8 in. for conventional types. A 3-ft spacing between rows means about 24-in. clearance, which is well adapted to common-size air diffusers.

An entirely different approach to brightness control is represented by the semi-indirect lighting system employing luminous plastic reflectors suspended from the ceiling. Part of the light reaches the working plane directly through the plastic, but the major portion is reflected from the ceiling. When light sources are continuous and properly spaced, ceiling brightness is uniform and within limits of comfort. Ceiling and luminaire present very little contrast.

This type of installation is particularly suitable in a room containing highly reflective materials or shiny surfaces. Incidentally, if such a room is to be air conditioned, careful design is necessary because down drafts can be created by air deflected from the suspended fixtures.

• **Industrial lighting advances**—The recent emphasis on industrial building undoubtedly has promoted the increased activity in this phase of lighting. A new industrial reflector is chalking up impressive results. It is white on the outside as well as the inside and contains a top opening which allows 10 to 20% of uplight. This yields an illuminated ceiling and, consequently, low brightness contrast between fixture and ceiling, which is more comfortable.

If light sources are arranged in a grid pattern, two important objectives can be accomplished. First, high intensities can be obtained because more fixtures can be used. But more significant is the fact that shadows and reflections from shiny metal surfaces are remarkably reduced.

A recent 1,000-w incandescent reflector lamp presents an inexpensive light source for industrial high bay areas. Since the reflector is an integral part of the lamp, light output is not affected by dirt and dust, cleaning is not required, and the only item of maintenance is lamp replacement.

Mercury-vapor lamps have also been

BAFFLED CEILING, another form of area lighting, is suitable where direction of view is established, such as in a classroom. Baffles are of acoustical tile.

used extensively in high-bay areas. They are more efficient in operation than incandescent types since lumen output per watt is 2½ times greater. But mercury lamps require expensive auxiliary equipment so a proposal to employ them should be carefully thought out.

One disadvantage of the mercury-vapor lamp is the absence of red from its spectrum, resulting in bluish-green light. For this reason, a combination of mercury and incandescent luminaires has been used commonly. Recently, however, two manufacturers have released color-corrected mercury lamps.

Still, where power interruptions are frequent, the use of mercury-incandescent combinations should be continued. Mercury lamps require 20 minutes to reach full brightness after an interruption; incandescent lamps can supply partial illumination during this period.

• **More new lamps**—Several other lamp developments have been in the spotlight recently. The popularity of deluxe fluorescent lamps due to increased efficiency ratings is one.

A drawback of standard fluorescent lamps is poor color rendition, caused by the small percentage of red contained in their spectrums. Deluxe cool-white and deluxe warm-white lamps do not suffer from this defect; facial colors seem to come to life, every object containing red appears fresher and richer under light from these lamps.

When deluxe lamps were introduced a few years ago, their lumen output was 60% of the standard lamp. At present, the figure is 75%. Further research is expected to raise efficiency to a par with standard lamps.

Another development concerns the great increase in rated life of T-17 (T means tubular and the number indicates diameter in eighths of an inch) 40-w low-brightness fluorescent lamps. This will serve to make their application more economically acceptable.

A new fluorescent lamp has just been released to be used in conjunction with a new ballast. Designated as "smooth-start" or "quick-start," the lamp operates without a starter. When energized, it comes to full brightness within one second and without blinking or flicker. A number of such lamps controlled by one switch will light simultaneously.

Artificial sunlight containing ultraviolet and infra-red rays is now economical for hospitals and industrial recreational solaria. A pre-assembled 5x5-ft 7-kw ceiling panel costs about $350.

Finally, there is available a new disposal unit for used fluorescent tubes that sells for less than $90. It crushes the lamp into a powder which can be washed down a drain.

A brand new threat to the privy

ELEVEN MILLION PRIVIES serving 22.5% of all U. S. dwellings measure the need for a new system of home sewage disposal. Septic tanks and absorption fields are not the complete answer, for they won't work in all soils.

But last week in Cleveland the engineering division of American Public Health Association, in its 80th annual meeting, heard what may well prove to be the answer—or a step in its direction.

Don E. Bloodgood, professor of sanitary engineering at Purdue University, told APHA of an aerobic process that works on recirculated water—in effect, a sewerless toilet. The research he described indicates that a family-size activated sludge plant is possibly in the offing.

• **How it started**—His interest in this possibility of aerobic household sewage disposal brought Professor Bloodgood together with Carl Boester, housing consultant for Purdue University. Mr. Boester, in turn, took the idea to Hal McPherson, builder of a grinder toilet for trailers, and fostered the McPherson Foundation for Sanitary Research, source of funds with which the Purdue Research Foundation has carried on its studies.

The idea was to see if a small activated sludge unit would handle sewage wastes from a home. Researchers Robert Perry and Lawrence Rigby went to work on the project in November, 1950.

• **What was done**—There were three parts to the test. For the first 399 days a McPherson grinding toilet was used; for 100 days, a standard flush toilet; for a total of 137 days, the McPherson unit went back into use with its effluent recirculated continually as flush water.

Toilet equipment was installed in the sanitary engineering laboratory. In the hydraulics laboratory, on the floor below, a rectangular tank divided into aeration and settling compartments was installed. Its aeration compartment had a 175-gallon capacity; the settling compartment had a volume of 52 gallons and a bottom slope of one on one.

Compressed air used came through standard diffuser tubes. Influent was metered. Effluent went to a floor drain except when it was recirculated by pump in the third part of the test. In the last three weeks of the test, means other than the compressor were used for aeration. Air was drawn into the pump discharge with an aspirator; and for two days included in Professor Bloodgood's report air was taken into the pump suction by a flutter valve. Both means apparently worked.

For these tests, two pumps were used: one to aerate, the other to flush. But it is believed by the researchers that a single pump can be valved to do this double duty.

Sanitary engineering students cooperated in the tests by using the experimental facilities and recording requested information. Chemical analyses were run continuously and records of paper consumption were kept.

Recorded data are in the tables on page 41.

• **What was concluded**—The plant ran

In case you've heard of this before . . .

This aerobic process of household sewage disposal had some early promotion in Washington, D. C., last February at a National Association of Home Builders meeting.

At that time a sewerless toilet, claimed to cost $400 less than prevalent plumbing prices, was reported operable with a 75% saving in water use. Dollar savings in water cost, less cost of powering a recirculating pump, were quoted $2 per month per unit. The unit proposed for use was a waste-grinding toilet, a 60-gal tank and 1/6-hp helical-rotor pump. It was reported that 3-gpm recirculation would keep the grinder spinning at 800 rpm and pick up air sufficient to "oxidize" all but a residue of some ¾ lb of sludge per person per year.

It is noteworthy that in describing actual details of the process to the APHA last week, Professor Bloodgood emphasized the following:

"No information was collected on costs of operation. . . . It has not been determined what the optimum size of tank should be. . . . The idea (of this research project) was to find out whether the process could be made to work."—Editor

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for 399 days without any odors, nor any removal of solids except for those carried in the effluent. It was decided that a 227-gallon tank is sufficient for a family of three, but the minimum practical size was not determined.

When the plant switched to a regular flush toilet for 100 days, a 4-in. line to the aeration tank had to be substituted for the 1-in. pipe that had been sufficient in size to carry ground wastes. According to Professor Bloodgood, "there appeared to be solids everywhere" during this part of the test. Some had to be removed by siphoning off an inoffensive sludge.

It was concluded that grinding is necessary; aeration alone won't disintegrate the solids.

From part three of the tests it was concluded that recirculation of the water does no harm to the process and causes no nuisance. Importance of this recirculation as a conservation measure in water use is obvious.

Computations based on data from the first 399-day period indicate that the 114.5 lb of solids, including paper, fed to the system was reduced 82.7% by solution, biological action and suspension in the effluent to a mere 19.75 lb of solids in the tank at the end of the run.

PERIOD I—399 DAYS

McPherson Toilet in Use (Average Figures)

Date (1950)	Aeration Tank pH	Dissolved Oxygen	Temp. °C	Mixed Liquor Solids ppm	Effluent Sus. Sol. ppm	Effluent BOD ppm
Nov. 28–30	8.0	5.2	—	169	12	—
Dec.	8.0	4.4	17.0	983	29	45
(1951)						
Jan.	7.1	3.2	17.9	1746	58	39
Feb.	7.0	3.0	17.5	1536	35	25
Mar.	6.7	2.3	19.4	1740	66	30
Apr.	6.9	2.3	19.9	2536	33	28
May	6.0	2.7	21.7	4040	48	27
June	5.7	2.3	23.4	4700	52	19
July	6.7	1.5	23.8	5900	11	8
Aug.	—	—	—	—	—	—
Sept.	6.9	—	20.9	8334	—	—
Oct.	6.6	3.8	21.8	8560	16	5
Nov.	6.7	3.9	17.8	9546	9	5
Dec.	5.6	4.5	17.7	10450	9	6
Avg.	6.8	3.3	19.8	4640	32	22

PERIOD II—100 DAYS

Flush Toilet in Use

Date (1952)	Aeration Tank pH	Dissolved Oxygen	Temp. °C	Mixed Liquor Solids ppm	Effluent Sus. Sol. ppm	Effluent BOD ppm
Jan.	6.9	3.9	18.8	11,148	14	13
Feb.	6.9	3.7	18.8	6060*	33	38
March	6.8	2.7	19.5	3690	30	29
Apr. 1–9	6.7	1.1	20.1	4267	26	17
Avg.	6.8	2.9	19.3	6280	26	24

*Sludge removed and lost. Maximum 8000 ppm., minimum 1400 ppm.

PERIOD III—137 DAYS

Recirculation in Use

Date (1952)	Aeration Tank pH	Aeration Tank D. O.	Temp. "C"	Mixed Liquor Sol. ppm	Recirculated Water Sus. Sol. ppm	Recirculated Water Chloride ppm
Apr. 17–30	5.3	2.0	23.2	3613	60	200
May	5.6	2.7	24.1	5930	293	527
June	5.4	6.2	27.6	7705	378	1103
July	7.6	30.9	27.7	7084	555	1304
Avg.	6.0	2.4	25.6	6070	322	784

U. S. tests concrete panel to pare barrack costs

Experiments are being made at Frankfurt, Germany, to determine the feasibility of forming prefabricated reinforced concrete panels, larger than any ever produced in Europe.

Before installations representatives of the United States Air Forces in Europe, a concrete panel measuring 16 x 8 ft was formed successfully in a demonstration conducted jointly by Atlantic Engineers, Inc., of New York City, and the French construction firm, Enterprises Metropolitains et Coloniales.

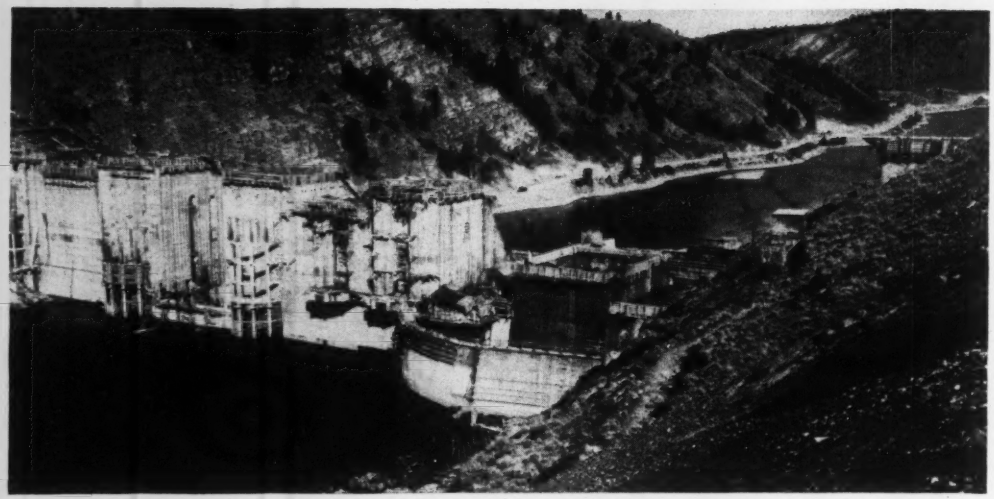
A very dry, high strength concrete was spread in a form into which 2-in. welded wire matting and steel bars had been placed. A large vibrating machine was then rolled into place over the form, the mold lowered into place, and the machine started.

Four electric motors connected to eccentric weights caused intense vibration which forced the weight of the mold down to give the diaphragm of the panel its 3-in. thickness, and to force the concrete up into the spaces of the mold which form the outside edges and the reinforcement ribs of the panel.

Vibration of the almost dry concrete also packed the mix so firmly that within 15 minutes the panel was formed and strong enough to carry a man's weight.

The prefabricated reinforced concrete panel was designed expressly for the Air Force by Atlantic Engineers, Inc., a combine that has been formed by four engineering and architectural organizations.

The panel, which can be made in two sizes—16 x 8 ft for floors and roofs and 9 x 8 ft for walls—is of an unpatented design. The molding machine also is so constructed that any contractor can built it.



PLACING CONCRETE in the central monolith of Canyon Ferry Dam (left center) was started behind precast bulkheads.

Third-stage diversion at Canyon Ferry Dam

THE THREAT OF HIGH WATER isn't worrying the contractors on Canyon Ferry Dam, located 17 miles east of Helena, Mont. They have successfully made their third and final stage of diversion.

One central monolith (Block No. 12)—purposely left low to handle second-stage diversion—has been sealed off and excess flow of the upper Missouri River will be handled by two temporary diversion tubes in Block 12, and by permanent outlets through adjacent monoliths.

With the river thus under control for a third time by man-made regulatory works, the contractors (Canyon Constructors) have their sights set on completing their $11.9-million prime contract for the dam and power plant by July 19, 1953. This part of the project is now more than 75% finished.

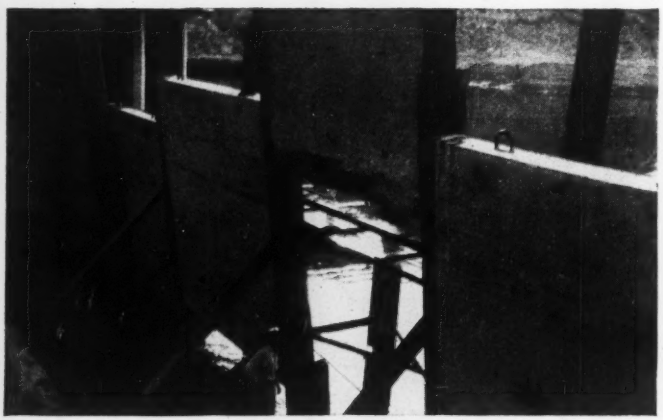
• **Key water project**—Canyon Ferry Dam is the Bureau of Reclamation's $29.5-million key project in water development for central Montana (ENR Apr. 17, 1952, p. 68). It will store water for the irrigation of 310,000 acres of new land in the Missouri River basin, and provide supplemental water for an additional 196,000 acres. Total reservoir storage will be 2,051,000 acre-ft.

Another major function of Canyon Ferry Dam—which is a 340,500-cu yd concrete gravity-type structure 225 ft high, with a crest length of 1,000 ft—is the production of hydropower for that area. Its three generating units have a combined rated output of 50,000 kw. The first power is expected to be put on the line by November of next year.

• **Early diversion problems**—Diversion has always been a headache for the contractors. Initial diversion, started late in 1949 (ENR Aug. 3, 1950, p. 32), employed an open-top timber flume to carry the river around the construction area. The following spring, river waters undermined the upstream cut-off wall under the flume, flooding the construction area and much construction equipment.

In December of 1951 high water overtopped a temporary upstream cofferdam, flooding the powerhouse area. This set the project behind schedule, but no serious damage was done to work in place, or to construction equipment.

• **Bulkheading Block 12**—Third-stage diversion was accomplished by lowering large reinforced concrete bulkheads into vertical steel channel guides. They sealed off the upstream face of the monolith that had been left low to handle second stage diversion. Flashboards were placed on the top of old Canyon Ferry Dam, a short distance upstream, to control the river flow



CONCRETE BULKHEADS were dropped in place between steel channels to seal off the upstream face of the low monolith, permanently closing the dam.

HIGH WATERS last spring were permitted to flow through the dam, over a central block that had been left low to handle second stage diversion. Old Canyon Ferry Dam is in far background.

while the bulkheads were being placed.

Currently this monolith is being brought up to the top of adjacent monoliths to eliminate the possibility of overtopping from any flash floods. The bulkheads will remain in place as a permanent part of the dam. Two 10-ft temporary diversion tubes through this monolith will be plugged with concrete later when all danger of rising water is past.

Concrete placed to date includes more than 250,000 cu yd of the 340,500 cu yd in the dam proper; 10,000 cu yd in the powerhouse structures; and 31,000 cu yd in the spillway and appurtenances.

Major items remaining to be installed in the powerhouse, when completed, include: The placement and testing of three 23,500-hp hydraulic turbines, three governors, and three 16,667-kva generators.

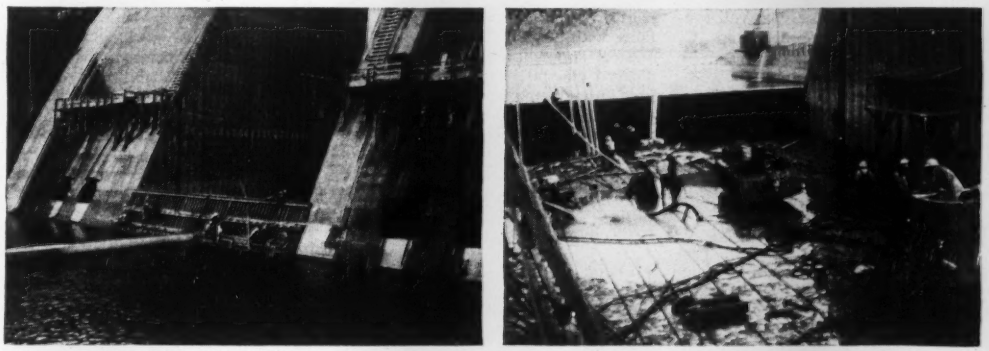
• **Monetary status**—At the end of fiscal year June 30, 1952, obligations totaling $21.6 million had been made, out of the estimated total project cost of $29.5 million. Allotments from Missouri basin funds for the current fiscal year ending next June were $4.7 million. This amount, plus a balance of $1.7 million available from previous years, makes a total of $6.4 million for work during the current period.

At the end of last June, 82% of the land to be flooded by the reservoir had been purchased. The balance of the land has been appraised and negotiations for purchase are in progress. All contracts for clearing the reservoir site have been awarded.

• **Foreign interest**—Construction operations at Canyon Ferry Dam are a point of interest to foreign engineers. To date, more than 60 engineers from 20 foreign countries have visited the project, with the lengths of their visits ranging from a few hours to three months.

Canyon Ferry Dam has had its construction difficulties, but its safety record has been good. No injuries of a very serious nature have occurred during the last 20 months, according to William P. Price, construction engineer for the Bureau of Reclamation. This year the dam is going through its most hazardous stage, construction-wise, and employee-safety is being watched vigilantly since only 10% of injuries are caused by mechanical failures, said Mr. Price.

Lawrence P. Sowles is project manager for Canyon Constructors. This joint-venture contracting group is composed of J. C. McGuire & Co., Brown and Root, Inc., Wunderlich Contracting Co., and Griffith Co.



PANEL TIMBER FORMS, 10 ft high, placed on the downstream face (at left) permit placing of the first two 5-ft lifts of concrete. Small pipes (at right) are part of more than 82-miles of 1-in. thin-wall pipe embedded in the concrete to cool it.

INTERCHANGE where traditional cloverleaf is replaced with system of normal left and right turns at intersection of Edsel Ford and John Lodge expressways in Detroit.

$180-million expressway program passes the one-third mark

Detroit's $180-million expressway program passed the $62-million mark this month with the opening of another half-mile section of the cross-town Edsel Ford Expressway.

The Ford Expressway, which eventually will permit six lanes of traffic at highway speeds for 14 mi across the city west to east, is now open from the west-side city limits to Warren Avenue, a distance of 2.55 miles.

Glenn C. Richards, general superintendent of Detroit's Department of Public Works, said that—barring hitches—the Ford Expressway will connect with the north-south John C. Lodge Expressway early in 1954.

Present schedules call for the completion of the entire Detroit expressway program by 1957. The Ford Expressway at present picks up the Detroit terminus of the Detroit Industrial Expressway, completed to Willow Run Airport and Ypsilanti, about 35 mi from downtown Detroit. This expressway is part of the Detroit-Chicago Expressway program, on which extensive work is now in progress at various points between Detroit and Chicago.

On Detroit's east side the Ford Expressway, when completed, will connect with the as yet unofficially named Blue Water Expressway to Port Huron. Parts of this system, in the Selfridge Air Base-Mt. Clemens area are now completed.

The John C. Lodge Expressway will run 9 mi from Jefferson Avenue north to connect with the James Couzens Highway. Eventually this will connect with an expressway system running northwest to the Grand Rapids area.

The Lodge Expressway, at present open for ¾ of a mile from Holden Rd. to Pallister Rd., is expected to be opened by Jan. 1 from Pallister Rd. to Grand River Ave., which serves Detroit's northwest section. This distance will total 2.31 miles.

Steel supply problems which have delayed schedules for the complex tri-level interchange where the Ford Expressway crosses the Lodge Expressway have been licked, Richards said.

The interchange is unique. It does away with the traditional cloverleaf and allows traffic to make left-right turns normally with no interruption of traffic flow.

• **Traffic handling**—Detroit citizens, who are resigned to crawling home during rush hours at an average speed of 15 mph—during good weather—look forward with justifiable enthusiasm to the opening of the new sections.

The Edsel Ford Expressway section which has been open for about one year has cut drastically the traffic problems on Michigan Avenue between the westside city limits and Livernois Avenue, the street to which the Ford Expressway is opened.

Grand River Avenue, according to Richards, handles about 50,000 cars a day with snail pace speeds during rush hours despite a system which permits four lanes of traffic in one direction for rush hour traffic.

The short opened lengths of the Ford and Lodge expressways are now handling better than 40,000 autos a day at speeds upwards of 40 mph despite the fact that there is not maximum flow at the exits.

Richards said that, when, completed, each expressway will handle at maximum safe speeds at least 90,000 autos a day.

The planning of the Detroit expressway program, which is part of the Michigan intrastate highways system, began in 1944. Actual construction got under way in 1947.

Under the direction of State Highway Commissioner Charles M. Ziegler, the program is jointly administered by the State Highway Department, the Wayne County Road Commission, and the City of Detroit, in conjunction with the Federal Bureau of Public Roads.

Cost is averaging out at about $8 million per mile of completed expressway. Financing is through a 25-year bond issue by the state which will be retired by the weight and gasoline tax collections.

Survey advises authority for city's water supply

Pittsburgh's antiquated, over-burdened water system came in for another analysis last week as consulting engineers recommended that it be modernized and rehabilitated.

The new survey, made by Morris Knowles, Inc., of New York, duplicates in many respects the program recommended by the commission set up some time ago by Mayor David L. Lawrence to study water supplies and sewage treatment.

The Knowles survey calls for creation of a Pittsburgh Water Authority on the ground that an authority would be able to operate in the black without raising the present water rates. The Study Commission also recommended an authority.

Under the new program, the proposed authority would sell bonds

totaling $69 million to cover the cost of purchasing the water system, then modernizing it.

The survey report called for virtually top-to-bottom replacement. The present filtration plant got harsh criticism. The report said extensive rehabilitation is needed. To solve the problem, the consulting firm offered two alternate construction programs which it labelled "A" and "B".

Program "A" calls for spending about $18 million to modernize the present slow sand filter set-up and the filtration plant. It is said that 14 of the present 56 filter beds are out of commission or are available only for limited use.

Program "B" is more ambitious. It calls for expenditure of around $27 million to cover what the report called minimum repairs to the present system, plus construction of a new, rapid sand filter. Morris Knowles said the new plant could be ready for 1957 operation.

One of the benefits of a new filtration plant, the report said, by way of side comment, would be elimination of the iron and manganese in Pittsburgh water which has plagued housewives in dry spells by staining their laundry.

Both proposed programs call for repairing all reservoirs and mains connecting reservoirs and pumping stations. Also recommended in both programs is replacement of all lines larger than four inches and installation of new main feeders, that is, mains 16-in. or larger.

The new report found the water output adequate in both quality and quantity. It said the water was entirely safe for drinking purposes but subject to seasonal variances which cause acidity, hardness and precipitations of iron and manganese.

Distribution system piping was described as generally satisfactory. The water main breaks which harass Pittsburghers on occasion were blamed on the character of the soil, topography and pressures in the system.

Providence expressway westbound lanes to open

Completion of the Providence, R. I., $9-million Olneyville Expressway—the first freeway ever undertaken in New England's second city—is expected Nov. 1.

Philip S. Mancini, state public works director, expects to get westbound traffic started by that date.

Eastbound traffic on a part of the extensive bypass of Providence's second commercial center has been in operation since late August. Completion of the freeway and its feeder roads is expected to clear up one of the worst bottlenecks on the Hartford-Cape Cod artery—U. S. Route 6.

Before the freeway was built, eight major highways converged on Olneyville Square—jamming 48,000 vehicles through a tightly restricted business section every day. Traffic counts showed that 32,000 of the 48,000 vehicles were through traffic.

Although the distance between the east and west approaches to the freeway is less than a mile and a half, it has taken as much as 15 minutes—longer in rush hours—to negotiate the distance. Now time will be less than five minutes.

For the 40% of Providence's factory workers who are employed within the immediate neighborhood of the square, the expressway is expected to speed up getting to and from work.

For stores in the square it is expected to ease parking and improve accessibility.

For suburbs to the west of Providence, it is expected to end a traffic barrier that has separated them from downtown Providence.

M. A. Gammino Construction Co. was the contractor on all phases of the federally-assisted project.

Vertical street in Oregon will soon be repaired

The straight up and down Elevator Street of Oregon City, Ore., is scheduled to get a new shaft.

A $175,000-bond issue was sold in mid-October to finance rebuilding of the 37-year-old municipal structure, an elevator that carried passengers—free—106 ft from the downtown business section to the principal residential district on a bluff just above the district and railway tracks.

Oregon City Manager Robert A. Finlayson says construction will start as soon as supervising engineers can be hired.

The elevator is enclosed in a wood-framed shaft supported by a steel tower. At present the shaft stands free of the bluff; Southern Pacific Railway tracks are squeezed between the two. A bridge reaches from the upper level of the shaft to the residential district.

Tentative plans for the new structure, drawn by Otis Elevator Co., call for building a concrete shaft abutting the bluff, with the approach to the lower level via tunnel under the tracks. The tunnel will free the intersection of peak-hour pedestrian traffic and eliminate the necessity for the bridge at the top of the shaft connecting with the residential district.

Coliseum for Columbus Circle

Robert Moses, chairman of the Triborough Bridge and Tunnel Authority of New York City, last week announced plans for the redevelopment of the Columbus Circle neighborhood of New York's west side, just southwest of Central Park.

The total cost of the redevelopment will be $40 million, of which $20 million will be invested by private builders in an apartment project and $20 million spent by the authority for a convention coliseum and parking garage.

The coliseum, for convention use only and not for athletic events as had previously been planned, will cover 49% of a 6-acre site. The other 51% will be occupied by an apartment project.

The redevelopment has been planned under Title I of the Housing Act of 1949. After approval of the site by the Federal Public Housing Administration an advance of $40,000 for the preparation of plans was made by the agency.

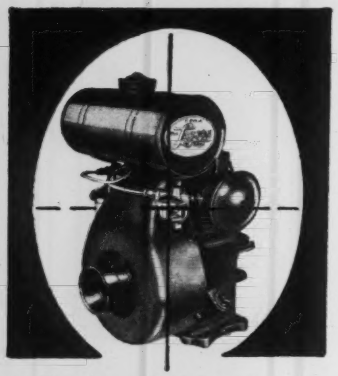
Under the procedure to be followed, the cost of the land is written down, two-thirds of it by the federal government, the remaining one-third by the city, to cover the loss represented in the value of the buildings cleared from the site.

Moses said the first step toward procuring title to the area would be taken in the state supreme court within two weeks, when condemnation proceedings would be instituted.

Excavation and demolition would begin immediately afterward, he said. The whole project should be completed in two years.

Moses foresaw no difficulties in the condemnation proceedings and because of a good offer from a "responsible" private builder, whose name he would not disclose, said: ". . . we'll move very fast now."

The long projected redevelopment of the area had once included a plan to build a $15-million Metropolitan Opera House, but that scheme was dropped because of "many difficulties," although $1 million had been pledged toward its building at one time.



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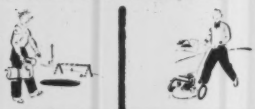

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INTERNATIONAL

Peru pushes major river diversion

On two widely separated fronts, the Republic of Peru—with the aid of U. S. engineering and construction firms—is pushing plans to increase agricultural capacity.

The developments are in the northern Department of Piura, and on the Pampas de los Castillos in the Ica Valley, south of Lima.

• **Biggest job yet**—The Piura project is said to be the largest river diversion project ever undertaken in Peru.

The $8-million job is being handled by Morrison-Knudsen of Peru, a subsidiary of the parent company in Boise, Idaho. It comprises in all 13 tunnels and about 15 miles of lined canals, as well as aqueducts and bridges. Known as the Quiroz irrigation project, it will divert water from the Quiroz and Chipillico rivers to the Piura valley to supply water to about 76,000 acres of cotton land. Additionally, about 50,000 acres of desert land will be reclaimed.

The job extends over 53 miles in all, and is slated for completion by 1954.

George M. Haensel of San Francisco is project engineer at the site.

• **Reclaim desert**—Also to aid the country's cotton producing capacity, the government is building the Pampas de los Castillos irrigation project in the Ica Valley. The Pampas is a stretch of barren desert land which adjoins a fertile valley about 200 miles south of Lima. Although the soil and climate are said to be ideal for cotton cultivation, the area has been idle and unproductive because of lack of sufficient rainfall.

Under terms of a contract with the Peruvian government, Harold T. Smith, Inc., a U. S. firm which has operated for many years in Latin American countries, undertook to carry out a program of test drilling to find underground sources of water supply; to build 50 large-diameter filter wells and do other work necessary for distribution of water.

The company moved to the job site with a staff of nine U. S. engineers and technicians and crews of Peruvian workmen. As of August of this year, 20 wells have been brought in, producing between 10 and 25 gal of water per second. Engineers estimate that total production of the wells will be adequate to irrigate about 14,500 acres of land.

Plan $76-million work to develop Nicaragua

Construction—and plenty of it—is called for in a blueprint for a five-year plan for economic development of Nicaragua.

The recommendations are made in the report of a mission that has completed a one-year study of the country under sponsorship of the Nicaraguan government and the International Bank for Reconstruction and Development.

The program is designed to effect progress simultaneously in industry, power, transportation, health, education and agriculture.

Specific objectives: Completion of a major highway network, a complete net of farm-to-market roads, railway modernization, rehabilitation of ocean ports and improvements in lake transportation, tripling of Managua's power capacity, and establishment of new industry and grain storage facilities.

Plans call for meeting present power needs with steam until water resources can be developed.

Ideal total for the program would be $76 million, according to the mission, with a bargain job possible for a minimum of $59 million.

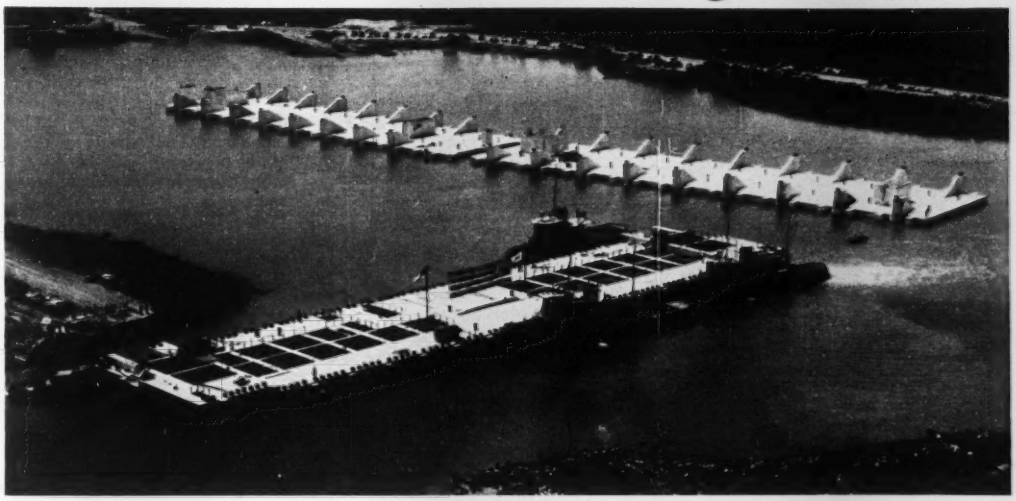
International briefs

• **Mexican dam contract**—The Mexican Ministry of Hydraulic Resources has awarded a contract for about $9 million to Morrison-Knudsen Sonora, Mexican affiliate of Morrison-Knudsen of Boise, Idaho, for construction of the Mocuzari storage dam on the Mayo River in northwestern Mexico. The structure will be of earthfill, with rock facing, 60 meters above the river bottom, to store water to permit irrigation of about 150,000 acres of land.

• **Guatemala road open**—Guatemala has opened another paved section of the Pan American Highway near the border with El Salvador. The road is a 12-mile black top section, built at a cost of $882,000. The road remains partially unpaved between Guatemala City and the southern frontier.

• **Technicians travel**—35 technicians of administrative personnel of the Department of State have completed a four-week orientation course as preparation for Point Four assignments in 20 countries of the Eastern and Western hemispheres. Their specialties embrace sanitary engineering, industry, irrigation, and instruction work.

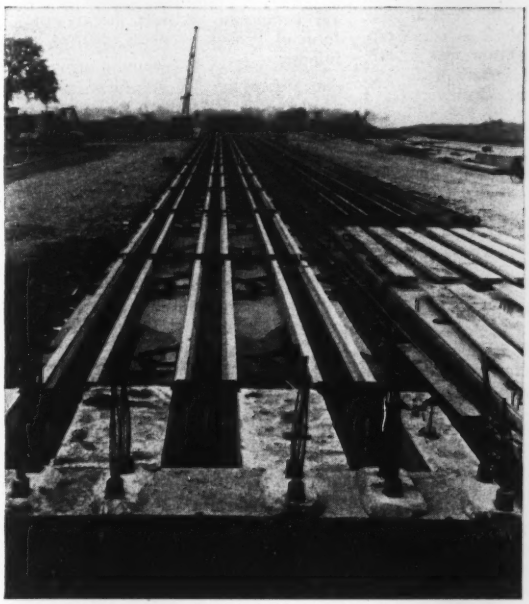
For New York's Amazing Pier 57



First section of Pier 57 starts its 38-mile trip down the Hudson River. More than 50,000 barrels of Lehigh Cements are being used in the construction of the pier.

Owner: **City of New York, Dept. of Marine & Aviation**
Consulting Engrs.: **Madigan-Hyland, New York**
Contractors: **Merritt-Chapman & Scott Corp. and Corbetta Construction Company**
Ready Mixed Concrete: **Colonial Sand & Stone Co.**
} **All of New York**

Prestressed Concrete Stringers made with LEHIGH EARLY STRENGTH CEMENT



Prestressed Stringer bed ready for concrete. This is one of four, each consisting of a 5" slab, 10' wide, 384' long. Side forms were made of concrete instead of wood for faster stripping and resetting.

Prestressed concrete has taken another step forward. Now it has been used for the 3300 main deck stringers of New York's new Pier 57, as the most practical and economical concrete design for the extraordinary load requirements.

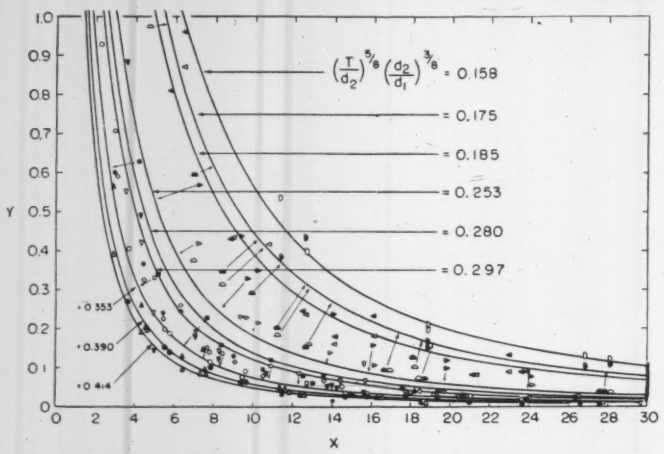
In casting the stringers, Corbetta Construction Company used mass production methods and Lehigh Early Strength Cement. Their operational cycle called for setting forms, prestressing and pouring 48 stringers on one of four casting beds each day. Stringers were removed and forms re-used on the fourth day after each pour.

Without the use of Lehigh Early Strength Cement, more than twice as many casting beds would have been needed . . . more than twice as many concrete side forms.

This is another example of the advantages of Lehigh Early Strength Cement in modern concrete construction methods.

LEHIGH PORTLAND CEMENT COMPANY, Allentown, Pa., Chicago, Ill., Spokane, Wash.

Lehigh CEMENT



NEW EQUATION PLOTTED gives for the first time the data needed for proper plumbing stack design.

Standards Bureau evolves answer to plumbing stack design problem

Investigations by the National Bureau of Standards have led to successful solution of an old problem of plumbing stack design.

No satisfactory method has existed heretofore for determining the maximum flow that should be introduced into the stack from a horizontal branch at some intermediate floor of a multistory building when water is being discharged at a given rate down the stack from higher floors. As a result of the present work—part of a broad program of research sponsored by the Housing and Home Finance Agency—hydraulic engineers Robert S. Wyly and Herbert N. Eaton have developed an equation that relates the many variables involved in stack flow phenomena and makes it possible to determine the minimum stack size required to meet any given conditions.

• **Pressure is the problem**—There are two basic problems involved in determining the diameter of the stack. First, what design discharge shall be assumed? Second, the pressure conditions in the stack must be investigated.

Discharges from plumbing fixtures enter the stack through sloping drains of relatively small diameter, so the flow velocity in these drains is quite small—in most cases probably on the order of 3 fps or less. When the water enters the stack, it is immediately accelerated downward by gravity, and within a short distance it assumes the form of an annular sheet flowing down the inside surface of the vertical pipe.

Velocity of the sheet increases rapidly during the first few feet of fall; then as the frictional effect of the wall on the sheet of water increases (as it does with increase in velocity), the velocity increases more and more slowly, until finally the frictional force exerted by the wall exactly balances the force of gravity on the water. From this point on, the sheet of water travels down the stack at a constant velocity which is known as the "terminal velocity."

If water from a drain at some intermediate floor level is to enter the stack at a point where a sheet of water from higher floor levels is flowing downward at high velocity, the water from the drain must break through or deflect part of the sheet of water at that level. This can occur only after sufficient backpressure has been built up in the drain at the point of entry into the stack. When the flow down the stack or the flow out of the branch, or both, are excessively large, this backpressure may cause the water in the drain to back up into shower stalls or bathtubs, may affect the functioning of ventilating pipes, or may cause sluggish flow from fixtures on the branch.

In experimental investigation, water was forced downward from a cylindrical chamber that produced an annular sheet of water simulating that which ordinarily flows down the wall of a plumbing stack. The velocity of this sheet could be varied, and the thickness of the sheet of water could also be altered.

• **Conclusions**—Among the more practical conclusions reached as a result of the NBS investigation are:

At any horizontal branch-stack connection, the combined flows in the stack and in the horizontal branch should not cause the horizontal branch to flow under an excessive hydrostatic head, or backpressure. A logical limit seems to be that condition which allows a horizontal branch to flow just full near its junction with the stack. The equation developed can be used to determine the various flow combinations that give this result. Here it is:

$$Y = 8.33 - 14.8\left(\frac{T}{d_2}\right)^{1/4}\left(\frac{d_2}{d_1}\right)^{1/4} Y^{1/4} X^{-1/4}$$

in which T is the thickness of the sheet of water flowing down the pipe wall in inches, d_1 is the diameter of the stack in inches, d_2 is the diameter of the branch in inches, and X and Y are composite variables having the form of Froude numbers, defined as follows:

$$X = \frac{v_1^2}{2g(h_2 - h_1)},$$

and

$$Y = \frac{v_2^2}{2g(h_2 - h_1)},$$

where v_1 is the average velocity of flow in the sheet of water in the stack in feet per second,

v_2 is the average velocity of flow in the branch (flowing full at outlet) in feet per second,

h_1 is the pneumatic pressure head in the stack at the level of the branch in question in feet head of water,

h_2 is the hydrostatic head in the branch at a distance 4 branch diameters back from the stack in feet head of water,

and g is the acceleration of gravity in feet per second squared.

Working curves were prepared by plotting this equation for different values of the product,

$$\left(\frac{T}{d_2}\right)^{1/4}\left(\frac{d_2}{d_1}\right)^{1/4},$$

and are shown in the accompanying illustration.

Construction has adventure for George A. Fuller Co.

"I have often sat back and pondered just what a contractor's function is," says Lou R. Crandall, president of George A. Fuller Co.

"I think a contracting firm is a service organization—mainly one with some financial risk. That kind of an organization is, of course, only as good as the people in it. There's a bit of professionalism in contracting, if a contractor wants to run his business that way."

Lou Crandall speaks with considerable authority on the subject. As head of a firm that has done more than $2 billion worth of business since its founding, that has pioneered in new techniques and new forms of construction, he's a top figure in the construction industry today.

Crandall and his company are not only willing to take a chance—it sometimes appears they are out looking for the opportunity.

He doesn't search for unusual structures, but the owners apparently seek him. They frequently call on him and his staff so that their knowledge and experience can be brought to bear on construction problems while the architects are developing the design. Owners, architects and contractors are keenly aware that there can be no failure in the construction of any project. On the success of any job, Crandall stakes the reputation of his firm, and its financial security.

If Crandall sometimes seems to go out of his way to find these unusual projects, it is because he is a product of the George A. Fuller Co. tradition of pioneering. Results have included the glass-walled Lever House in New York (designed by Skidmore, Owings & Merrill), and Alcoa's aluminum-clad building in Pittsburgh (designed by Harrison & Abramovitz). For Fuller, those structures are two more in a long line of construction firsts that go back to the first steel skyscrapers.

The firm was founded by George A. Fuller in 1882. An architect, Mr. Fuller was fond of invention. With land values skyrocketing in the downtown sections of America's fast-growing cities—particularly cities like New York and Chicago—he foresaw the future for tall buildings, and realized the thick-walled structures of the time would fast become obsolete. With a group of leading building designers of that period, he helped to develop the successor—steel skeleton frames with much thinner curtain walls.

In 1889 his company completed the first two steel-skeleton skyscrapers in the U. S.—the Tacoma Building and the Home Insurance Building in Chicago. For several years after that, Fuller built every major addition to the Windy City skyline.

Toward the end of the century, son-in-law Harry S. Black became the guiding influence in the company, taking over as president when the founder died in 1901. Mr. Black saw new opportunities in the East. In 1901, he was building the Flatiron Building, first steel skyscraper in New York.

Among landmarks of the period credited to the company were: the Times Building in Times Square (1904); Pennsylvania Station in New York City (1909), a milestone in solving the city's transportation problems; and the Pennsylvania (Statler) Hotel in 1917.

These were the beginnings of a firm that built a tradition of its own for shattering traditions in building construction. From there, the record of George A. Fuller Co. is intertwined with major building developments in a fast-building nation; it is written on the skylines of nearly every major city in the country.

• **Enter Crandall**—In 1917, when Lou Crandall joined the company as a young civil engineer fresh from the University of Michigan, Fuller was building the Lincoln Memorial in Washington, D. C. By the time the project was completed in 1922, he was manager of the Miami, Fla., office.

During the swift years of the 1920's, Crandall saw the firm mushroom. At the peak of this period came Chicago's Hotel Stevens—largest hotel in the world and the largest single construction contract ($18-million) ever awarded to that time.

Crandall's own career mushroomed, too. In 1925, he became a vice president; in 1928, only 34 years old, he took over the helm as president. But in 1929 came the depression.

• **Swift shift**—It was a tough way to start an administration. The challenge, this time, was one in business management instead of construction. The bottom dropped out of the private commercial building market, so Crandall turned to public projects. Among the most notable: the Supreme Court Building completed in 1933; the Department of Justice Building in 1934; the U. S. Archives Building in 1935; the Department of Interior Building in 1937.

LOU CRANDALL, president of the George A. Fuller Co., likes to take a chance.

The private construction market had not entirely dried up. It was in this period that the organization built the first all-welded steel building in the U. S.—for General Electric Co. at Pittsfield, Mass. Key to success of the structure was G. E.'s development of a short-wave radiation weld-testing device for determining the soundness of welds.

The Marshall Field Building in Chicago came along, capping Fuller's recovery from the depression. It was constructed in three sections during 1933-34-35.

Crandall also reached out into Canada and Cuba, tapping foreign markets. Feeling a "wanderlust," he pushed the organization into road-building, bridges and dams.

• **Placing new bets**—On the eve of World War II, Lou Crandall found his firm at a three-way intersection,

Aim of firm is to build better and more economically

and decided to take all three roads.

The straight road ahead meant continuing the commercial building program. Another pointed to expansion into industrial construction. The third led to construction of airfields, naval bases, army camps, and other war facilities.

Fuller got to work as early as 1939 to meet the demands of the armed services. It brought to the job experience from World War I (when it built Camp Funston and even built a shipyard and turned out eight steel ships).

Teamed with Merritt-Chapman & Scott (and with Crandall as chairman of the operating committee), the company built for the Navy such installations as: the huge Naval air base at Quonset Point, R. I. (where first practical designs for the famed Quonset Hut were developed); bases in Newfoundland, Iceland, North Ireland and Scotland; development of temporary air facilities—a vast manufacturing and shipping project; the huge projects of Pacific Naval Air Base Constructors.

For the Army it built such installations as Fort Dix, N. J. (a huge expansion and rehabilitation job); Fort Lewis, Wash.; Fresno Air Base and Flying School. It had a big hand, too, in one of the Atomic Energy Commission's key plants.

No less spectacular were industrial building accomplishments in the war period. Part of the Geneva, Utah Steel Works; synthetic rubber plants in Texas; munitions, aircraft, cable and engine factories in widely separated areas; the $87-million Dodge-Chicago plant, largest single industrial plant in the world.

• A new deal—After World War II, the company again began playing its trump suit—commercial construction.

Fuller-Turner-Walsh-Slattery, Inc., was formed, with Lou Crandall as president, to construct the United Nations Secretariat Building. Fuller also had Parkway Village, housing project for UN personnel under way; the 100 Park Ave. building was going up; Lever House was started not long after; the Alcoa building climbed skyward; and the foundations were going in for the Prudential Life Insurance Building in Chicago.

Since it was first organized, George A. Fuller Co. has done a volume in excess of $2 billion. Of this total, $1.4 billion has been done during Crandall's presidency. Last year the firm had a gross income of over $3 million. Today, with more than $85 million in work ahead on the books, Crandall is looking for new adventures.

It has long been a Fuller policy to develop its own leadership by training its own men. Example: Crandall, the ten Fuller vice presidents and the secretary-treasurer have a total of 344 years of service with the firm.

• How it works—When a job is obtained, the vice president who negotiated the work follows through from the original agreement to completion of the project.

To do his job, he has the entire Fuller organization. Plans and specifications are put through a series of studies by technical divisions, then reviewed by legal and insurance advisers. These studies produce a sizable list of suggested alternates that are offered to the architect, consulting engineers, and owner as possible better ways to do the job.

"It is our function to interpret the architect's design and make it a reality in the field. From our experience, we try to find ways to build the structure better and more economically," Crandall says. "We have ideas on materials and on methods of construction. We know from the work we have done, and from the experience of other contractors, where something went wrong, and where something else worked out unusually well. This information we pass along to the designers whenever we have the opportunity. We try to make each project a 'character' building—economically constructed for its own individual purposes."

While the design is being studied, the Construction Department prepares schedules and readies job organization charts which are also submitted for approval, along with a suggested plant setup and actual job layout.

Starting with the first month of construction, detailed and fully comprehensive cost reports keep the architect and owner abreast of costs as the work proceeds.

"Even on strictly competitive projects, where we receive plans and specifications and take the work for a fixed sum, we go over the job carefully," Crandall says. "If we find anything we think is wrong, we try to bring it to the attention of the architects and owners before anyone is hurt."

• How it works out—Although the big and unusual projects have given George A. Fuller Co. a reputation for pioneering, Crandall points out that for every building of this type, the firm builds scores that are more conventional. As an example of how Fuller operates under "normal" conditions, Crandall cites the recently completed 100 Park Ave. building.

"It was built to be rented, for an investment. The building had to offer something attractive that would rent at a price that would give a return for the investment. To build it, we were employed on the same day as the architects.

"The architects prepared designs, and we provided estimates until the fundamental shape was decided on. We were estimating all the time on the preliminary drawings, to see if the economics were right. As the plans developed, the owner could figure his rents and the return on his investment.

"After plans were developed and budget figures were ready, we began to get subcontractors' prices. If any were out of line, we asked why. What are the problems and how can they be solved?

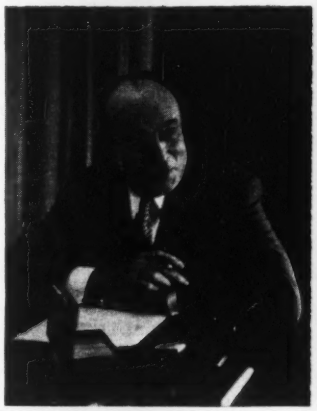
"Architects often ask us about materials and installed equipment," Crandall went on. "They ask for our experience with both installing and maintaining them. Take the partitions at 100 Park Ave.; the architects and our men considered seven different kinds. Quality, availability and cost were explored with manufacturers' representatives. Everything about them was discussed; we estimated the cost and offered our opinions; then the architects made the final decision.

"Once the plans were completed, and construction got under way, close cooperation between the designers and us continued as construction methods uncovered new problems. The final product was the result of highly integrated teamwork by everyone on the job."

• Aces in the hole—"We are continuously considering applications of new building materials and equipment and new methods of construction," Crandall says.

"Lots of new products are coming on the market all the time, and we look into them very carefully." (Fuller has a yard in Long Island City where it carries out research projects.) "Sometimes colleges do testing jobs for us. And I've found there are

PRESIDING over a meeting of the board which directs the three-pronged activities of the firm in commercial, industrial and military building. (ENR photos by Compton)



"WHAT is a contractor's function. . . . Contracting firm is a service organization . . . mainly with some financial risk."

many manufacturers who will help us."

No detail is too small for thorough study. Crandall cited a dormitory where hinges are failing on the doors. According to the plans, they were adequately designed, so Fuller investigated. "We found the boys in the dorm were swinging on the doors and damaging the hinges. So now when we build dormitories we use the extra heavy kind—with four screws."

"Prestressed concrete? We used 60-ft prestressed beams in a building at Manhattanville College. It was a case where necessity was the mother of invention; we couldn't get steel. But we worked out changes in design with the prestressing subcontractor, and came up with changes that saved headroom and saved money. The owner got the benefit of some good thinking."

Fuller also researches a lot of new construction methods at its Long Island City yard. Before tackling the Alcoa building in Pittsburgh, two complete floors of the building were constructed in the yard for experimental purposes.

As a practical example of how this research pays off, Crandall cites the construction of a 16-story federal building in Los Angeles designed for earthquake resistance.

"We got the job on a lump sum bid. It called for a 14-in. concrete outer wall. In analyzing the cost, we decided to pump the concrete. Pumping concrete was fairly new in those days, and we found we couldn't do it with standard equipment because

of the height of the structure. So we worked out a system of booster pumps and successfully completed the highest pump job up to that time."

• **Systematic planning**—When plans for the New York Infirmary now under construction were started, the feasibility of steel vs concrete construction was analyzed. While much of Fuller's pioneering has been in steel structures, the firm found that this building could be constructed more economically in concrete—and that was the final decision.

On analyzing the design for another building, Fuller found the steel was too heavy—apparently it had been designed to meet the building code of another city. The saving was substantial.

This is the Fuller approach, and Crandall says the reason his firm becomes involved in so many unusual jobs is largely the result of this approach.

Take the Alcoa building. Fuller began working about five years ago with Alcoa to develop the exterior facing of sheet aluminum.

"We also started looking for a material that could be used behind these walls, something thinner and more economical than brick and plaster, that could take the wind load and serve as insulation in addition. In meetings with Alcoa, we narrowed the possible materials down to five or six, then considered them for brittleness, absorption of dampness, ease of handling, cost.

"We came up with a mix of diatomaceous earth and portland cement. Then we built an office building for Alcoa in Davenport, Ia., with cast aluminum exterior backed up with this material. Another innovation there: Aluminum piping for radiant heating was prefabricated and installed in large-size panels. We learned a few things.

"Plans for the new building in Pittsburgh were completed using a different facing—stamped aluminum sheet. The lightweight concrete backup was sprayed on metal lath to a 4-in. thickness. We built two stories of this building in our research yards to test it. We learned some more. The final product was worked out over a period of about 3 years. The ideas and basic thought are still Alcoa's, but we played a role in the evolution of what we have today."

This, then, is the Fuller system. It turns gambles into a calculated risk. As Crandall puts it, "It's a tremendously interesting field, it gives men pride in their work—pride while they are doing it and pride when they have completed it."

WILLIAM H. NALDER, chief designing engineer, of Bureau of Reclamation, retired.

Bureau design engineer ends 43 years service

Retirement of William H. Nalder, chief designing engineer of the Bureau of Reclamation, was announced at the bureau's engineering offices in Denver.

Chief Engineer L. N. McClellan said the retirement came because of ill health, adding: "Bill Nalder is so much a part of this organization that it seems hard to imagine getting along without him. We all hope that his health will permit him to continue on a part-time basis as a consultant."

For Nalder, the retirement ended 43 years service with the bureau which began five months after his graduation from Washington State College in 1909. Since 1917 he has been with the bureau's engineering offices in Denver, which serve the entire bureau.

Considered one of the nation's top authorities on design of water and power structures, Nalder is a member of the Colorado Society of Engineers and American Society of Civil Engineers, in which he serves on the executive committee of the national ASCE hydraulic division.

In 1949, he served as staff adviser on irrigation to the U.N. Economic Survey Mission for the Middle East.

Before joining the Denver Bureau offices, Nalder worked on the Yakima Project from 1909 to 1912 and on the Sun River Project in Montana until 1917.

Until 1931, he was a designer in the Denver offices. Then he became assistant chief designing engineer under John L. Savage and succeeded Savage as chief designing engineer after Savage's retirement in 1945.

Nalder said: "I've just done each job as it came before me. Everything we've accomplished was cooperative—by teamwork. The men who do the actual designing, not the supervising, deserve the credit, and they never get it—at least in print."

Nalder's assistant, O. L. Rice, has been named acting chief designing engineer of the bureau.

Careers . . .

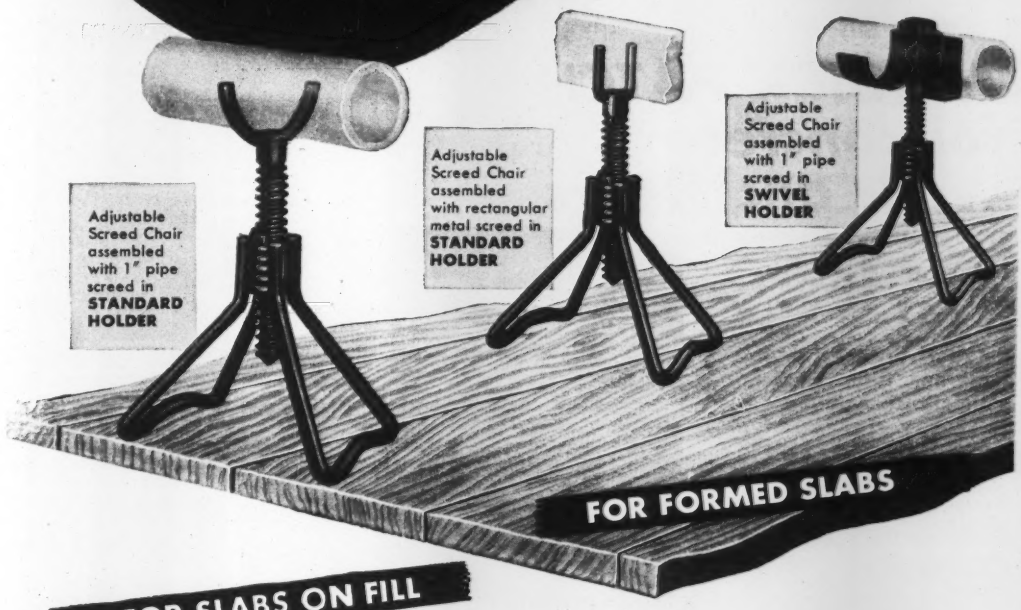
• **Appointed**—Corps of Engineers has sent **Horace A. Johnson,** chief designer in the Sacramento, Calif., district office, to France to assist in the design of military installations in Europe. . . . Former vice-chairman of the Oklahoma State Highway Commission, **Joe Curtis,** has been chosen chairman of the commission. . . . **Hugh H. Creighton** has joined the firm of Kelly & Gruzen, architects and engineers, as a project manager in the hospital division. . . . Newly appointed head of the civil engineering section of Miller-Warden Associates, Swarthmore, Pa., is **H. S. Mattimore.** . . . **William M. Stewart,** former chief engineer with the province of Saskatchewan highway department, has been named deputy minister in the department. . . . **Ernest T. Perkins** of Hartford, Connecticut has been appointed director of highway traffic-planning design of the State Highway Department.

• **Elected**—**P. D. Davis,** of Durham, N. C., has been elected president of the North Carolina section of the ASCE. . . . **E. J. James** chief engineer, of the Louisiana Highway Commission has been elected president of the Southeastern Association of State Highway Officials.

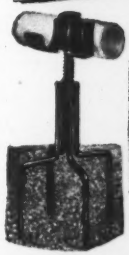
• **Honored**—Korean Veteran **Donald P. Lessig,** now a Carnegie Institute of Technology graduate student, will be the first recipient of a new research fellowship in civil engineering established this year at Carnegie by the Rust Engineering Co. . . . **Dr. Kenneth F. Maxcy,** professor of epidemology at Johns Hopkins School of Hygiene and Public Health, received the Sedgwick Memorial Medal, highest annual award of the Public Health Association.

• **Resigned**—**Franklyn C. Rogers** has resigned his post as professor of civil engineering and director, Joint Highway Research Project, at Rutgers University to return to India as resident engineer for the Harza Engineering Co., Chicago, consultants to the Damodar Valley Corp., of Calcutta.

SUPERIOR *Adjustable* SCREED CHAIRS


Adjustable Screed Chair assembled with 1" pipe screed in STANDARD HOLDER
Adjustable Screed Chair assembled with rectangular metal screed in STANDARD HOLDER
Adjustable Screed Chair assembled with 1" pipe screed in SWIVEL HOLDER
FOR FORMED SLABS

FOR SLABS ON FILL



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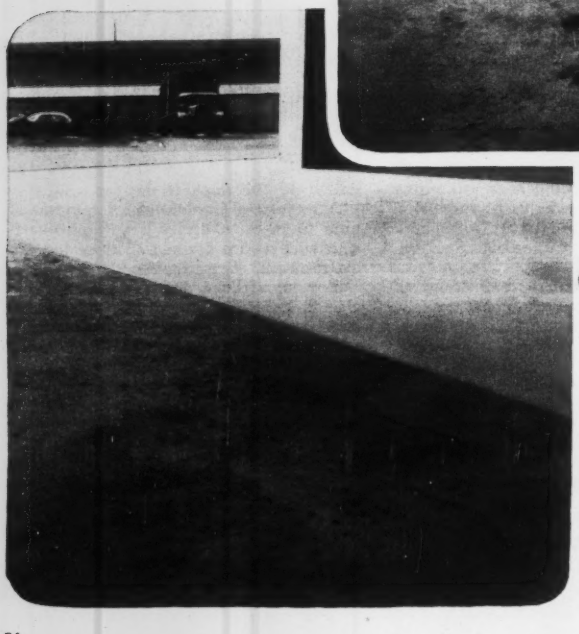

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BOOK REVIEWS

Very good reading

ENGINEERS AND IVORY TOWERS — By Hardy Cross. Edited and arranged by Robert C. Goodpasture. 141 pp. McGraw-Hill Book Co., New York 36. $3.00.

Hardy Cross is more widely known for his contributions to engineering practice than for his equally renowned logical methods of thinking and for his ability to state his conclusions with clarity and conviction. This comes about because his many comments on engineers, engineering and engineering education have not been as widely publicized as his methods of structural analysis or of determining the flow in a distribution system.

In this little book, one of his students has undertaken to correct that situation. From Prof. Cross' classroom notes, lectures, society papers and magazine articles, Mr. Goodpasture has selected and presented in logical sequence the philosophy of Prof. Cross as it has developed over the past 30 years. Prof. Cross' comment on such subjects as engineering education and graduate study is particularly pertinent at this time. The whole book is stimulating reading.

Studies of piles

THE RESISTANCE OF PILES TO PENETRATION—Second edition. By Russell V. Allin. 126 pp. E. & F. N. Spon Ltd., 22 Henrietta St., London, W.C. 2, England.

The title, "The Resistance of Piles to Penetration," was carefully chosen to set forth the author's viewpoint that dynamic pile-driving formulas can only give this, the resistance to driving, and that the ultimate bearing power of the soil may be more or less, depending upon the characteristics of the soil. Redriving tests are therefore recommended.

The book is based upon the Hiley dynamic pile-driving formula, the value of which the author states has not been seriously challenged since the first edition of this book appeared over 20 years ago. Thirty pages of text contain explanation of the basis of the formula, of the information which may be obtained from it, and examples of its use. These are followed by tables for various weights of ram falling 18, 36, and 54 inches (and other heights by interpolation) onto wood or concrete piles of various lengths, showing the ultimate resistances to penetration for various sets. Double-acting and differential-acting hammers are not covered.

An informative chapter has been added in this edition to explain the relation between pile driving and soil mechanics, and the effects of driving in different soils—Reviewed by ROBERT D. CHELLIS, Weston, Mass.

More about soils

SOIL ENGINEERING—By Melvin G. Spangler. 458 pp. The International Textbook Co., Scranton, Pa., $6.50.

The texts devoted to soils as engineering materials continue to grow in number. This one is designed to meet the need of men with little formal training in the field of soil mechanics.

About half the book is devoted to applications of soil engineering to design of structures. The chapter on underground conduits—sewers, culverts and water mains—is unusually complete.

Notes on Pamphlets

• **Project Cirrus**—"Final Report, Project Cirrus," describing work done by the General Electric Co. from 1948 to 1951 in the science of artificial weather, is now available from the Office of Technical Services, U.S. Dept. of Commerce. It is a summary of work on the moisture precipitation phenomena in clouds. The 362-page report sells for $9 in microfilm and $46.25 in photostat form, from Library of Congress Photoduplication Service, Washington 25, D.C.

• **Atomic blast protection**—The Federal Civil Defense Administration has issued "Improvement of Shelter Areas" which contains recommendations for providing protection in existing buildings from atomic attack. Intended primarily for engineers and architects, it is Part II of a study "Shelter from Atomic Attack in Existing Buildings" (Part I is written for laymen). Measures cited include: (1) Separation of boilers and furnaces from shelter areas by masonry walls; (2) removal of suspended ceilings in shelter areas, and elimination of heavy concentrated loads on the floors above; (3) replacing glass panels near shelter areas with non-shattering substitutes; and (4) strengthening of floor above, and improving exists. Copies may be secured from the Superintendent of Documents, Washington 25, D. C. for 15¢.

• **Fire endurance** of gunite concrete slabs reinforced with wire mesh improves when sawdust is substituted for some of the sand aggregate. This is the conclusion reached in Building Materials and Structures Report 131, "Fire Tests of Gunite Slabs and Partitions," an 11-page booklet published by the National Bureau of Standards. It is obtainable for 15 cents from the Superintendent of Documents, Washington 25, D. C. The report also says that partitions made with sand only in the concrete or with the addition of a small amount of asbestos fiber showed early failure.

New Engineering Books

INDUSTRIAL WASTE TREATMENT—By Edmund B. Besselievre. 391 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. $7.00.

ARCHITECTURAL GRAPHIC STANDARDS—By Ramsey & Sleeper. Fourth Edition. 614 pp. John Wiley & Sons, New York 16, N. Y., and Chapman & Hall, London. $10.00.

HIGHWAY RESEARCH BOARD PROCEEDINGS, 1950—532 pp. Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. $7.50.

PROCEEDINGS: AMERICAN RAILWAY ENGINEERING ASSOCIATION—Volume 53, 1217 pp. American Railway Engineering Association, 59 East Van Buren St., Chicago 5, Ill.

PUBLICATIONS: INTERNATIONAL ASSOCIATION FOR BRIDGE AND STRUCTURAL ENGINEERING, 1951. 389 pp. Published by the General Secretariat, Zurich, Switzerland.

NUMERICAL METHODS IN ENGINEERING—By Mario G. Salvadori and Melvin L. Baron. 258 pp. Prentice-Hall, 70 Fifth Avenue, New York, N. Y. $6.75.

STRENGTH OF MATERIALS—Second Edition. By John W. Breneman. 140 pp. McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. $3.00.

STRENGTH OF MATERIALS—By Frank J. McCormick. 177 pp. The MacMillan Co., 60 Fifth Ave., New York 11, N. Y. $3.75.

STATISTICAL THEORY WITH ENGINEERING APPLICATIONS—By A. Hald. 783 pp. John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. $9.00.

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LEGAL

"Approximately" defined

A subcontractor, performing the plastering for an addition to a hospital was given an oral order to do extra work. He told the general contractor that the work would cost "approximately $900 or $1,000."

The work cost considerably more than $1,000 and when the general contractor refused to pay more than $1,000, the subcontractor brought an action to recover the full amount that he claimed the job cost him. The trial court granted him $1,454, which judgment was reversed on appeal,[1] the appellate court holding that the amount of the judgment was excessive.

The appellate court in its opinion stated: "Expressions such as 'about', 'more or less', and 'approximately', in qualifying quantity, price, and the like are often used in contracts and they have generally been held to mean a reasonable approximation to the quantity or price specified. [Citing cases]. In the case at bar the amount of $1,454 found by the judge cannot fairly be said to be approximately $900 or $1,000, and was excessive as a matter of law. In its brief the defendant has asked us to fix the amount. This we decline to do. Essentially the question is one of fact to be determined by the trial judge, within the legal limits discussed above, in the light of all the evidence. We hold only that in awarding damages which were 45% more than the highest sum specified by the parties, the judge exceeded these limits."

(1) Muir Bros. Co. v Sawyer Const. Co., 104 N.E. 2d 160, Supreme Judicial Court of Massachusetts, Feb. 27, 1952.

Damages resulting from government regulations

The Court of Claims held recently[1] that the government is not liable for damages sustained due to regulations of the War Production Board which prevented the contractor from securing materials needed to perform the contract. "This was an act of a general and public character affecting all persons situated similarly to plaintiff. It authorized exercise of sovereign powers in the defense of the nation. That the government is not liable for such acts needs no argument."

A contractor is not entitled to recover the increased cost of the work resulting from the government's system of priorities or from directives of the War Manpower Commission fixing a 48-hr week in the locality of where the work was being performed, even though such order required the contractor to pay overtime wages for eight hours.[2]

In a recent case,[3] a contract with a municipal housing authority provided that no person shall work more than five days a week nor more than eight hours in any one day. After the work had been started, the President issued an executive order directing a fuller utilization of available manpower in certain critical labor areas, which required that on certain projects, including the one covered by this contract, that the minimum work week be increased from 40 to 48 hours. The contractor complied with this order and had to pay time and one-half for the additional eight hours of work and brought an action to recover such excess costs. The contractor was denied a recovery.

(1) Gothwaite v United States, 102 Ct. Cl. 400.
(2) Clemmer Const. Co. v United States, 71 F. Supp. 917, 108 Ct. Cl. 718.
(3) American Store Equipment & Const. Corp. v Buffalo Municipal Housing Authority, 111 N.Y.S. 2d 688, Supreme Court of Erie County, N.Y., March 28, 1952.

Satisfactory performance

Where a contract requires performance to the satisfaction of one of the parties, the law is well settled that "if the subject matter involves a question of fancy, taste or judgment the party receiving performance is the sole judge of his satisfaction, but where the subject matter of such a contract involves a question of commercial value, operative or mechanical fitness, or quality, or other like considerations, rather than personal satisfaction, satisfaction is accomplished if performance is such that it should be satisfactory to a reasonable man."[1]

(1) Ward v Flex-O-Tube Co., 194 F. 2d 500.

Delays due to war status

The U. S. Court of Claims, in two recent cases, where contracts with the government were involved, held that the government was not responsible for damages sustained by the contractor as a result of delays due to war conditions.

In one case[1], the contractor suffered damages as a result of delay on the part of the government in giving the required notice to proceed with the work. The delay resulted from the fact that due to war conditions it was necessary to obtain from the War Pro-

duction Board an authorization to commence the work in question.

The court in its opinion pointed out that in some cases it has been held that if the notice to proceed is withheld without cause for an unreasonable period, such act constitutes a breach of the contract. "But reasonableness is, in each instance, a question of fact. Taking into consideration the wartime circumstances under which the parties contracted, the knowledge of those circumstances attributable to the parties, the fact that the contract and related papers indicated that notice to proceed would be issued at the convenience of the government, and the fact that the Civil Acronautics Administration did its best to obtain prompt clearance from the War Production Board, we cannot say, in this instance, that the delay in giving plaintiff notice to proceed was so unreasonable as to amount to a breach of contract."

In the other case[2], the government under a contract with claimant obligated itself to furnish the contractor with steel needed to perform the contract. On account of war conditions and priority systems then in effect, there was a delay of 304½ days in furnishing the contractor with the material needed to perform the contract. The contractor brought the action to recover the damages sustained by reason of said delay. The court denied the contractor any recovery, having found as a fact that the representatives of the government had made every effort to obtain the necessary steel and that the failure to furnish the steel did not result from any fault or negligence of the government.

(1) Parish et al. v United States, 120 Ct. Cl. 100.
(2) Otis Williams & Co. v United States, 120 Ct. Cl. 249.

Increased difficulty

Merely because a contract has become increasingly more difficult and more expensive to perform due to laws enacted after the execution of the contract, does not excuse performance. This rule applies to laws and governmental orders such as placing freight embargos on the shipment of certain materials; increasing the work week, resulting in the payment of overtime wages; and requiring the obtaining of priority orders as a requisite to obtaining certain materials.

The general doctrine is well settled that when a party voluntarily undertakes to do a thing without qualifica-

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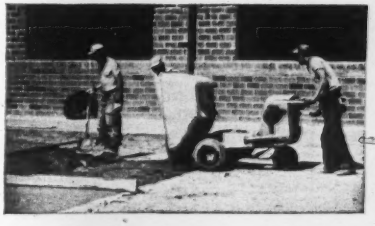

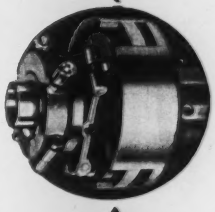

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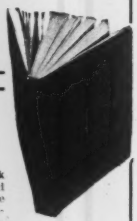

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Legal . . .

tion, performance is not excused because of accident or other contingency not foreseen, it becomes impossible for him to do the thing which he agreed to do. This doctrine protects the integrity of contracts. One of the reasons assigned in support of this doctrine is, that the parties could have protected themselves against such contingencies in the contract.[1]

In another case,[2] the court in its opinion stated: "It is a well-settled rule that a party must fulfill his contractual obligations. Fraud or mutual mistake, or the fraud of one party and the mistake of the other, or the inadvertence induced by the one party and not negligence on the part of the other, may relieve from an expressed agreement, as an act of God or the law or the interfering or preventive act of the other party may free one from the performance of it; but if what is agreed to be done is possible and lawful the obligation of performance must be met.

Difficulty or improbability of accomplishing the stipulated undertaking will not avail the obligor. It must be shown that the thing cannot by any means be effected. Nothing short of this will excuse performance. The courts will not consider the hardship or expense or the loss to the one party or the meagerness or the useless ness of the result to the other. They will neither make nor modify contracts nor dispense with their performance.

When a party by his own contract creates a duty or charge upon himself, he is bound to a possible performance of it, because he promised it, and did not shield himself by proper conditions or qualifications."

(1) American Store Equipment & Const. Co. v Buffalo Housing Authority, 111 N.Y.S. 2d 688, and cases there cited.
(2) Cameron-Hawn Realty Co. v City of Albany, 207 N.Y. 377, 101 N.E. 162.

Subcontractor not bound

Where a subcontract to perform part of the work on a building project contained no reference to the plans and specifications of the general contract, those specifications did not become part of the subcontract nor did they require the contractor to do his part of the work in compliance therewith. The subcontractor was only required to perform his part of the work in the common and usual way it is done at the place where the work was to be performed.[1]

(1) Cordle et al. v Scheaf, 104 N.E. 2d 455, Court of Appeals of Ohio, Sept. 21, 1950.

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

OBITUARIES

Edward Flad, 91, former St. Louis water commissioner and former member of the Missouri Public Service Commission, died Oct. 13 at St. Louis. He was graduated from Washington University as a civil engineer in 1881. In 1888, he designed the pumping plant for the St. Louis water works. Later he planned the city's complete filter plant. He was named to the Missouri Public Service Commission in 1917 and served four years. President Calvin Coolidge appointed him in 1924 as a member of the Mississippi River Commission, a post from which he retired in 1950. Mr. Flad retired from active business in 1932. For more than 50 years he was a member of the ASCE.

John R. Nichols, 69, a Boston structural engineer and member of the firm of Nichols & Norton, consultants, in that city, died in Rome, Italy, Sept. 29. He was educated at Harvard University, a life member of the ASCE, and a past vice-president of the American Concrete Institute.

Joseph W. Holman, Sr., 62, prominent architect of Nashville, Tenn., died in Zurich, Switzerland, Oct. 15. He headed the firm of Marr & Holman, and designed the $20-million Republic Aviation Corp. plant in Evansville, Ind., during the last war. Later he designed the Miami, Fla., sports stadium which has a cantilever roof. He was working on plans for a larger structure of the same kind for the Dominican Republic at Ciudad Trujillo. He designed many buildings in Nashville.

Jacob J. Straley, 70, a civil engineer and surveyor in Buffalo, N. Y., for nearly 50 years, died Oct. 11. He was graduated from Union College.

George C. Thomas, 63, a construction engineer with the Ontario Hydro Commission, died Oct. 10 in Toronto, Ont. He was an engineering graduate of the University of Toronto.

Fred L. Swickard, 57, vice-president and general manager of the Jennings Lawrence Co., civil engineers, Columbus, Ohio, died there Oct. 10.

Richard T. Ford, 78, builder of a chain of hotels in Rochester and Buffalo, N. Y., Erie, Pa., and Toronto and Montreal, Canada, died in Rochester Oct. 13. He built the State Education Building in Albany, the New York State Armory at Oswego and many Rochester schools.

Bids Asked—Low Bidders—Contracts Awarded—First Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

ELSIE EAVES, Manager — *J. A. MAHONEY, Reports* — *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† **N. H., Portsmouth**—CLEARING FACILITIES—B.A. On or About 11/14—U. S. Eng., 857 Commonwealth Ave., Boston 15, Mass. clearing a gross area of approx. 900 acres and disposing of cut timber and brush for facilities, Portsmouth Air Force Base. CD 12/27/51.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Walsh Brothers**, 150 Hampshire St., Cambridge, Mass. LB **$1,250,000**, est. $1,000,000. 2 DORMITORIES, WORCESTER, MASS. Holy Cross College, College St., Worcester, Mass. Bids Oct. 9. CD 10/3.

▲ **Fanning & Doorley Constr. Co., Inc.**, 274 Kingsley Ave. Providence, R. I. LB **$1,500,000**. GYMNASIUM, PROVIDENCE, R. I. Providence College, River Ave., Providence, R. I. CD 5/8/51.

▲ **E. & F. Constr. Co.**, 94 Wells St., Bridgeport, Conn., CA, **$2,489,000**. Moderate rental HOUSING, South end site, BRIDGEPORT, CONN. City Housing Auth., 252 Hallett St., Bridgeport, Conn. Bids Oct. 1. CD 10/7, under LB.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

† **D. C., Wash.**—LABORATORY—B.A. After 10/22—U. S. Eng., First and Douglas Sts. N.W., central dental laboratory, Walter Reed Army Medical Center, Eng. 49-080-53-16 (16). L. Justement, 2011 K St. N.W., archt. CD 8/4.

† **N. J., Trenton**—ALTITUDE EXHAUSTER WING EXTENSION—B.A. 11/6—Officer in Charge of Construction, Fourth Naval District Naval Base, Phila., Pa., extension altitude exhauster wing and misc. constr. N.A.A.T.T.S. Plans deposit $80. CD 9/20/51.

N. Y., Oakland—SCHOOL—B.A. 11/12—Co-ordinator of School Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, general constr., plumbing and drainage, heating and ventilating, electrical and lighting fixtures for new addns. and work in connection for P.S. 162, south side of 53 Ave., between 201 and 202 Sts., Queens Boro. Plans deposit $22 general constr. $6 each mechanical.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,

L. R. Strandberg & Son Co., Inc., 608 S. Dearborn St., Chicago, Ill., LB. **$1,284,693**, est. $1,370,000. 0.98 mi. Geneva City: Lake Front, Arterial, Pts. 1 and 1A, (Acc 0.14). FAC 52-8P, FAC 52-9, FAGC 52-10, Ontario Co.;

Bero Eng. & Constr. Corp., McKinley Bldg., Buffalo, N. Y. LB. **$662,047**, est. $692,000, 0.78 mi. Batavia City: Main St. and Oak St. extens. FA.C. 52-14, Genesee Co.; LB. **$2,948,209**, est. $3,400,000. 1.04 mi. Thruway; (4.48 mi. access), New York State Thruway-Ontario Sect. Subdivision 5A, 5B, 6A, 6B and 7A, S.T. 52-22. O.T. 52-14, R.C. 52-102, Genesee and Monroe Counties;

The Lane Constr. Corp., 37 Colony St., Meriden, Conn. LB. **$338,066**, est. $371,000, 0.69 mi. Bullshead Rd. C.R. 23 and Pattersonville Rd. C.R. 20, crossing the New York State Thruway, Mohawk Sect. Subdivision 16 (South Amsterdam By Pass-Pattersonville). S.t. 52-23. Montgomery Co.;

Serafini Constr. Co., Inc., Conklin Rd., Binghamton, N. Y. LB. **$581,413**, est. $613,000. 1.41 mi. Watkins-Lodi, Pt. 3, S.H. 6035, FA.RC. 52-99, Schuyler Co;

Slattery Contg. Co., Inc., 46-36 54 Rd., Maspeth, N. Y. LB. **$4,257,664**, est. $4,813,600, 0.65 mi. Expressway, 1.72 mi. Access, Cross Bronx Expressway, Cont. 9S, FA.CBE 52-1, Bronx Co. Bids Oct. 16. CD 9/23.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,

Merritt-Chapman & Scott Corp., 17 Battery Pl., New York, N. Y. LB. **$11,772,520**, est. $13,208,000. 0.92 mi. New York State Thruway-Hudson Sect. SUB 9B, (Hudson River Bridge), Cont. H.T. 52-3, Westchester Co. Bids Oct. 16. CD 9/20.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **Va., Langley Field**—LANDING SYSTEM—B.A. After 11/1 U. S. Eng., foot of Front St., Norfolk, instrument landing system, Approx. $100,000. CD 11/16/51.

† **Ala., Mobile**—PARKING APRON—B.A. On Or About 11/6—U. S. Eng., P. O. Box 1169, Zone 7, aircraft parking apron, Brookley Air Force Base, Eng 01-076-53-2. Extended date. CD 7/11.

S. C., Union—B.A. 11/10—City, sanitary sewerage imprvs. $350,000. Plans deposit $25. Harwood Beehe Co. Montgomery Bldg., Spartanburg, engrs. CD 11/21/51.

† **Fla., West Palm Beach**—MESS, etc.—B.A. 11/13—U. S Eng., P. O. Box 4970, Jacksonville, officer's mess and airmen's club at Palm Beach International Airport, Inv. 53-1. Extended date. CD 10/14.

† **Florida**—B.A. 11/18—U. S. Eng., 575 Riverside Ave., Jacksonville, Levee 7, hydraulic dredging, Central and Southern Florida Flood Control Proj., Palm Beach Co., CIVENG 08-123-53-15-B. Extended date. CD 10/8.

† **N. C., Fort Bragg**—UTILITIES—B.A. About Dec. 8—U. S. Eng., 308 Customhouse, Wilmington, clearing, grading, paving, installation of storm drainage, water supply, sanitary sewer and steam distr. systems for new troop housing area, Serial No. Eng 31-075-53-8. CD 12/26/51, under Public Buildings.

BIDS ASKED—BUILDINGS

▲† **Va., Fort Eustis**—WAREHOUSE—B.A. After 11/1—U. S. Eng., foot of Front St., Norfolk, warehouse, gear sheds, hardstands, marine repair shop and railway. Approx. $5,000,000. CD 8/13.

Ga., Atlanta—PLANT—B.A. 11/13—Montag Bros., Inc., Highland Ave., mfg. plant, $750,000. Plans deposit $50. Extended date. Moscowitz, Willner & Millkey, 761 Peachtree St. N.E., archts. CD 9/10.

▲ **Ga., Albany**—HOUSING—B.A. 11/15—Albany Housing Auth., Albany, 140 unit housing Project GA 23-5. $1,000,000. Dennis & Dennis, Macon, archts. CD 3/28.

N. C., Asheville—SCHOOL—B.A. 12/1—Buncombe Co. Bd. Educ., Asheville, Black Mountain-Swannanoa High School, Black Mountain. $600,000. Six Associates, Hendersonville Rd., archts. CD 3/19.

La., Thibodaux—COURT HOUSE—B.A. 12/10—Lafourche Parish Police Jury, court house annex, $350,000. Wm. R. Burk, 632 Pirates Alley, New Orleans, archt.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Grannis & Sloan, Thompson and Street & Wattinger**, P.O. Box 484, Richmond, Va., CA. **$2,868,200**. radio transmitter facilities, Naval Communications Center, Monogram, NOY 71277, Spec. 32847, PORTSMOUTH, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. Bids Sept. 23. CD 9/29, under LB.

† **Kenneth Fulghum**, Box 643, Pensacola, Fla., CA, **$514,329**, refrigerated Storage Bldg., 680 addn., PENSACOLA, FLA. Officer-In-Charge of Construction Box 45, U. S. Naval Air Station, Pensacola, Fla. CD 9/25, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Farnsworth & Chambers Constr. Co.**, 3018 Leeland St., Houston, Tex. LB **$4,526,834**. general contract;

H. W. Lancaster & Sons, 747 Roland St., Memphis, Tenn. LB **$2,175,104**. plumbing, heating, air conditioning;

Gibson & Odom Electrical Co., 4201 Thalia St., Jackson, Miss. New Orleans, La. LB **$701,634**, electrical work;

Otis Elevator Co., 122 S. Mill St., Jackson, Miss. LB **$326,414**. elevators for University of Mississippi MEDICAL SCHOOL and TEACHING HOSPITAL, JACKSON, MISS. State Bldg. Comn., Woolfolk State Office Bldg., Jackson, Miss. Bids Oct. 15. CD 8/15.

W. F. Holt & Sons, 1531 Demonbreun St., Nashville, Tenn. CA. **$824,700**. central HEATING PLANT for State Buildings, NASHVILLE, TENN. State Bldg. Comn., State Capitol, Nashville, Tenn. Bids Sept. 16. CD 9/26, under LB.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

O., Cincinnati—B.A. 11/4—City, City Hall, pumping station on Delta Ave. as adjunct to Little Miami Sewage Plant. $287,000. Plans deposit $25. Havens & Emerson, Leader Bldg., Cleveland, engrs. CD 6/24, under LB.

BIDS ASKED—BUILDINGS

Ind., Mishawaka—SCHOOL—B.A. 11/10—Penn Twp. School Two., 117 Lincolnway, grade school, $350,000. Roy Worden & Assocs., 312 W. Colfax St., South Bend, archts. CD 6/12.

Ind., Fort Benjamin Harrison—HOUSING—B.A. About 11/15—U. S. Eng., 475 Merchandise Mart, Chicago, 54, Ill., construct, manage and finance, 300 family unit in 48 buildings Wherry Housing, Serial No. ENG 11-032-53-26. Extended date. CD 10/8.

Ill., Chicago—HEADQUARTERS—Bids **Asked**—National Congress of Parents and Teachers, 600 S. Michigan Ave., Zone 5, 3 story headquarters bldg., Russ and Huron Sts. $750,000. Holabird & Root & Burgee, 180 N. Wabash St., Zone 1, archts. CD 10/28/49.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh, Pa., CA **$205,000**. 750,000 gal. water tank to remedy low water pressure, COLUMBUS, O. Upper Arlington City, Columbus, O. C.A. Niple, 1156 Westwood Ave. Columbus, O. engr.

Otto Taylor Constr. Co., 613 N. Woodbridge St., Saginaw, Mich. and **L. W. Wells Constr. Co., Inc.**, 1420 Miller St., Saginaw, Mich. CA **$187,566**. storm sewers in Lathrop Park section, SAGINAW, MICH. Saginaw Co., L. H. Frost, county drain comr., Saginaw, Mich. Bids Sept. 25 CD 9/18.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Peter Schumacher & Sons**, 321 Spring St., Mishawaka, Ind., CA, Approx. **$1,750,000**. 2 and 3 story, bsmt., brick, Iannon stone Central Catholic High SCHOOL, Michigan St. and Angela Blvd., SOUTH BEND, IND. Catholic Bishop of Fort Wayne, c/o Pastor of Holy Cross, 1520 Vassar St., South Bend, Ind. Awarded Oct. 7. CD 10/15/51.

Gerhardt F. Meyne Co., 8 S. Dearborn St., Chicago, 3, Ill., CA, **$300,000**, two dial EXCHANGES rehabilitation, 1300 S. Wabash Ave. and 520 S. Federal St., CHICAGO, ILL. Illinois Bell Telephone Co., 212 W. Washington Chicago 6, Ill. Awarded Oct. 9. CD 6/30.

Henry Brothers, 228 N. La Salle St., Chicago, 1, Ill., CA **$350,000**, 1 and 2 story, brick steel SCHOOL, CHURCH and CONVENT, LA GRANGE, ILL. St. Cletus Parish, 55 and Stone Sts., La Grange, Ill. Bids Sept. 15, awarded Oct. 10. CD 9/12.

John E. Vanden Berg Co., 1656 Hall St. S.E., Grand Rapids, Mich. CA Est. **$300,000**. 2 story, brick, masonry CHURCH SCHOOL, GRAND RAPIDS, MICH. Emanuel Evangelical Lutheran Parish, 338 Division St. N., Grand Rapids, Mich. Bids Aug. 22. CD 8/18.

▲ **Perron Constr. Co.**, 6525 Lincoln St., Detroit, Mich. CA **$4,500,000**. 1 story, concrete brick, steel paint PLANT, LANSING, MICH. Fisher Body Div. General Motors Corp., 401 Verlinden St., Lansing, Mich. CD 8/25.

WEST OF MISSISSIPPI

BIDS ASKED—BUILDINGS

Mo., St. Joseph—HOSPITAL—B.A. 11/6—Missouri Methodist Hospital, c/o Dr. O. J. Carder, 8 and Faraon

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	**Latin America**
Sewers, Waste Disposal	**Public Buildings**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

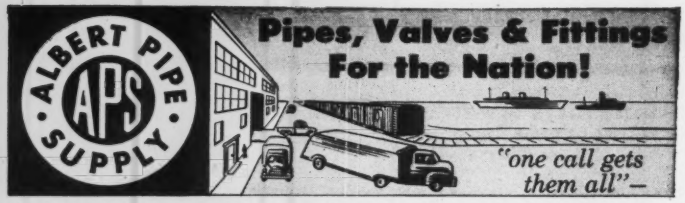
LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects invloved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily



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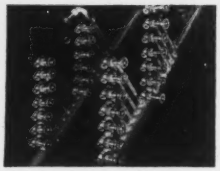

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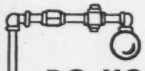

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St., 6 story, bsmnt., hospital addn., alterations, Cooper, Robinson & Carlson, 418 Commerce Bldg., Kansas City, Mo., archts. CD 7/26/48.

Tex., El Campo—HIGH SCHOOL—B.A. 11/6—El Campo Independent School Dist., El Campo, high school, $600,000. Extended date. R. S. Colley, 310 S. Tancahua St., Corpus Christi, Ford & Rogers, 228 E. Martin St. San Antonio, archts. Bluecher & Naismith, 401 N. Tancahua St., Corpus Christi, and H. Blum, 2812 Fairmount St., Dallas, engrs. CD 10/7.

▲ Kan., Kansas City—GENERATING PLANT—B.A. 11/19—Bd. P. Utilities, G. B. Little, secy, City Hall. Contr. K 27, electric power generating plant, $20,000,000. Plans deposit $40, Burns & McDonnell Eng. Co., 95 and Troost St., Kansas City, Mo., engr. CD 1/12/15.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† Al Johnson Constr. Co., Foshay Tower, Minneapolis, Minn., CA, $4,899,815, hydro-electric power plant at Blakely Mountain Dam, Garland Co., ARKANSAS. U. S. Eng., P. O. Box 60, Vicksburg, Miss. Bids May 22. CD 5/28, under LB.

† Davies Constr. Co., Rapid City, S. D. LB $302,680, group administration and secure storage bldg., at Rapid City Air Force Base, Inv. 25-066-53-51, RAPID CITY, S. D. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Oct. 10. CD 9/17.

Texas and New Orleans Ry. Co. (Southern Pacific Lines in Texas and Louisiana), L. A. Loggins, ch. engr., 913 Franklin St., Houston, Tex., Force Account, $100,000 railway yard and tracks imprvs., Rosenberg; $130,000, railway yard and track expansion and imprvs., Harrisburg; $145,000, railway yard and tracks expansion and imprvs., Houston, TEXAS. Grand total $375,000. CD 8/13.

F & C Engineering Co., 3018 Leeland St., Houston, Tex. LB $875,165. Wesleyan-Willowick Storm sewerage sys. and Kirby Dr. storm sewerage sys., HOUSTON, TEX. City, City Hall, 900 Brazos St., Houston, Tex. Lockwood & Andrews, Union Natl. Bank Bldg., Houston, Tex., engrs. Bids Oct. 8.

Southwestern Public Service Co., Plainview, Tex., Purchase and Hire, $200,000, some electric power transmission lines, Hale Co., PLAINVIEW, TEX.

▲ Texas State Prison Bd., c/o State Bldg., Austin, Tex. Own Forces. $1,250,000, 300 unit individual CELLS, near RICHMOND, TEX. CD 7/18/51.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Consolidated Chemical Industries, Inc., 111 Sutter St., San Francisco, Calif., and Humble Oil & Refining Co., Baytown, Tex. Own Forces. Approx. $4,750,000, sulphuric acid mfg. PLANT, BAYTOWN, TEX. CD 8/27.

Columbia Carbon Co., Conroe, Tex., Purchase and Hire, $475,000, Carbon Black PLANT EXPANSION, CONROE, TEX. CD 8/5.

Fisher Constr. Co., Box 6127, Houston, Tex., LB $613,900 CHURCH, ROSENBERG, TEX. Holy Rosary Church, Rosenberg, Tex. Mark Lemmon, 1210½ Main St., Dallas, Tex., archt. Bids Oct. 8. CD 8/27/51, under LB.

FAR WEST

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† Strand & Sons, 3939 University Way, Seattle, 5, Wash., CA, $3,355,000, 1 story, 200x407 ft. supply warehouse, 209x201 ft. storage and shop bldg., 209x201 ft. aircraft maintenance hangar and 261x302 ft. aircraft maintenance hangar, Ault Field, Spec. 35601, WHIDBEY ISLAND, WASH. P. Wks. Office, Thirteenth Naval Dist., 1611 Wheeler St., Seattle, Wash. Bids Oct. 2. CD 10/8, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

† Hall-Atwater Co., 605 13 Ave., Seattle, Wash., LB $357,915, est. $477,085, ordnance ammunition area, involving clearing grubbing, grading buildings, etc., Inv. 53-20, FORT LEWIS, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash. Bids Oct. 17. CD 9/5.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ Piggott Constr. Alberta Ltd., 12522 126 St., Edmonton, Alta., CA, $1,700,000 gas pipe line in Morinville area, northwest of Edmonton, 30 mi. gathering system, ALBERTA. Denton-Spencer Ltd., Barron Bldg. Calgary, Alta, engrs.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ B. Kaplan Constr. Co. Ltd., 4120 City Hall Ave., Montreal, Que., CA, Approx. $1,000,000, 10 story, concrete granite office, St. James and St. Francois Xavier Sts., MONTREAL, QUE. Syndicate, c/o contractor.

Proposed Projects

WATER SUPPLY

Calif., Fairfield—City, City Hall, voted $680,000 bonds, water treatment plant, reservoir, lines. CD 8/19.

▲ **S. C., Spartanburg**—City, water supply imprvs. $1,000,000. Wiedeman & Singleton, P.O. Box 1878, Atlanta, Ga., consult. engrs. CD 10/13.

SEWERS, WASTE DISPOSAL

▲ **Ala., Mobile**—City, City Hall, addnl. sanitary sewers, $2,250,000. J. B. Converse & Co., 106 St. Joseph St., consult. engrs.

▲ **Mass., Worcester**—City, City Hall, incinerator, $1,000,000, Anderson, Nichols & Co., 53 State St., Boston, consult. engrs.

Mass., Fairhaven—Bd. Selectmen, Town Hall, outfall sewerage sys. $980,000, Fay, Spofford & Thorndike, 11 Beacon St., Boston, consult. engrs. CD 2/8/50.

Mo., Independence—City, c/o Ray A. Heady, chn., City Hall, sewer, laterals addns., east of Noland Rd. $825,000, Wm. Prichard & Assoc., Independence, consult. engrs.

▲ **O., Cincinnati**—Hamilton Co. and City, Court House, const. Ross Run Trunk Sewer. $3,700,000. George Lemmel, Cincinnati, co. engr. T. J. Montgomery, city engr.

BRIDGES

▲ **FLORIDA**—State Road Dpt., Tallahassee, **Sarasota Co.**—12th Street Causeway $7,000,000.

▲ **Ill., Chicago**—City, City Hall, bascule bridge, double leaf trunion, over Chicago River, at Dearborn St., $2,000,000.

O., Cleveland—Cuyahoga Co., Court House, 3-arch, 400 ft. high level bridge and 400 ft. roadway crossing Euclid Creek Reservation on Monticello Blvd., South Euclid. $800,000. Albert S. Porter, Standard Bldg., engr.

STREETS AND ROADS

▲ **Calif., San Rafael**—City, City Hall, defeated bonds street imprvs. $1,040,000. CD 8/14.

▲ **Ky., Louisville**—City, Bd. P. Wks., City Hall, Sixth and Jefferson Sts., widen Second, Kentucky and Oak Sts., grade separations at 14 and Hill Sts., 10 and Hill Sts. and Floyd and Hill Sts. $1,500,000. W. W. Sanders, city engr. CD 6/1/51.

▲ **Neb., Omaha**—Douglas Co., Court House, belt highway for north-south traffic around western outskirts of city. $2,146,000. Harland Bartholomew & Assoc., 317 N. 11 St., St. Louis, Mo., and Kirkham, Michael & Assoc., 1504 Dodge St., consult. engrs. CD 3/3.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, **Nassau Co.**—exten. expressway from Horace Harding Blvd. at Nassau Co. line to Old Westbury. $30,000,000.

▲ **NEW YORK**—Triborough Bridge & Tunnel Auth., Randalls Island, New York, **Queens Co.**—3 mi. Queens Midtown Expressway from Brooklyn-Queens Expressway in Maspeth to Queens Blvd. in Rego Park, $18,000,000, Andrews, Clark & Buckley, 305 E. 63 St., New York, Zone 21, engrs. Conversion of Horace Harding Blvd. into expressway from Queens Blvd. to Nassau Co. line, $30,000,000.

EARTHWORK, WATERWAYS

▲† **Missouri and Arkansas**—U. S. Eng., 300 Broadway, Little Rock, Ark., 272 ft. high Table Rock Dam on White River for flood control and power, $80,000,000. ($3,000,000 appropriated).

▲† **New York**—U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md., Flood Control Unit 1, Monkey Run, Chemung River, at Corning, $1,000,000.

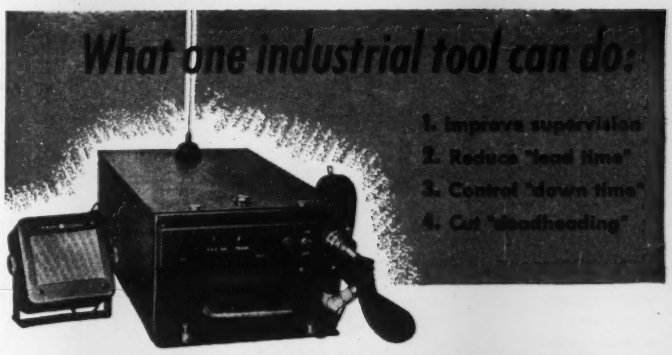
▲ **Oregon**—California-Oregon Power Co., 216 W. Main St., Medford, addnl. development at Tokatee Project on North Umpqua River, Lemolo Project 1; dam reservoir, outdoor type, 29,000 kw. capacity generator; Lemolo 2: diversion dam and 33,000 kw. outdoor type generator. Owner applied to FPC for license. $20,000,000. CD 5/3/51, under Unclassified.

▲† **Pennsylvania**—U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md., flood control, Unit 1, Susquehanna River between Scranton and Wilkes-Barre, $1,000,000; Levee Unit 5C, Western Branch, Susquehanna River, at Williamsport, Lycoming Co., $500,000; Unit 4 A, Western Branch of Susquehanna River, at Williamsport, Lycoming Co., $1,250,000. CD 4/21/44.

AIRPORTS

▲† **Ark., Blytheville** — OPERATIONS BLDGS., etc.—U. S. Eng. 300 Broadway, Little Rock, plans by Brueggeman, Swaim & Allen, Pyramid Bldg., Little Rock, operations bldgs. and 5 buildings; water, sewer, roads and railroad systems; Delta Eng. Co. Blytheville, Ark., consult. engr.; air base rehabilitation, incl. fueling facilities, Branson-Rutledge, Harrison & Mott, Blytheville, Ark. consult. engrs. CD 7/10.

▲† **N. Y., Niagara Falls**—AIR BASE—U. S. Eng., 80 Lafayette St., New York, Zone 13, plans by Crenshaw, Beardsley & King, 2112 Erie Blvd., East Syracuse, AFRTC facilities, $1,000,000-$5,000,000; security fencing, $100,000; fuel storage, parachute bldg., warehouse, ordnance storage, $100,000-$500,000; plans by Thomas H. McKaige, 881 Main St., Buffalo, taxiway, lighting, $100,000 all foregoing at Niagara Falls Air Force Base.



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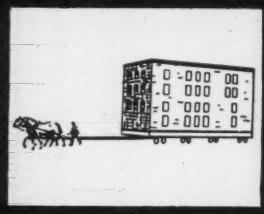

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▲ **N. Y., Plattsburg**—AIR BASE IMPRVS., etc.—U. S. Eng., 80 Lafayette St., New York, Zone 13, railroad and highway relocation, $1,000,000-$3,000,000; troop housing, $1,000,000-$3,000,000; misc. bldgs., Approx. $5,000,000; airfield pavements, grading facilities, Approx. $5,000,000. Seelye, Stevenson, Value & Knecht and Shreve, Lamb & Harmon Assoc., 101 Park Ave., New York, Zone 17, engrs.

▲† **N. Y., Westhampton**—AIRPORT—U. S. Eng., 80 Lafayette St., New York, Zone 13, plans by William Gehron, Weiskopf & Pickworth, 101 Park Ave., New York, Zone 17, misc. bldgs., $1,000,000-$3,000,000; security fence, QM gas station, alerted apron lighting, $100,000-$500,000 at Suffolk Air Force Base. CD 9/14/51.

Puerto Rico, San Juan—ROADS, etc.—Puerto Rico Transportation Auth., San Juan, roads and parking areas at Puerto Rico International Airport. $862,000. CD 9/5/50.

LATIN AMERICA

Mexico, Los Santos—State Govt., Palacio del Estado, Cuernavaca, Morales, plans irrigation dam. $500,000.

PUBLIC BUILDINGS

▲ **Ala., Troy**—SCHOOL—City, high school, $2,000,000.

Calif., Paradise—SCHOOL—Paradise Unified School Dist., Paradise, plans by Koblik & Fisher, 2203 Thirteenth St., Sacramento, Zone 18, Junior and Senior High School, $825,000. CD 5/25/51.

Calif., Riverside—POLICE STATION, etc.—City, 3606 7 St., bond election Nov. 18, for police station and jail, $500,000; fire station, $440,000. M. H. Irvine, C/O owner engr. CD 9/16.

▲ **Conn., West Hartford**—SCHOOL—Town Bd. Educ., Town Hall, plans by Moore & Salisbury, 10 Main St., East School, Whiting Lane, $1,500,000. Paul D. Bemis, 36 Pearl St., Hartford, mech. engr. Marchant & Menges, 967 Farmington Ave., Hartford, structural engrs. CD 5/21.

▲† **D. C., Wash.**—LABORATORY, etc.—U. S. Eng., First and Douglas Sts. N. W., biologic products research laboratory, $500,000-$1,000,000, incinerator at Army Medical Center, $100,000, at Walter Reed Hospital.

Ga., Atlanta—SCHOOL—Bd. Educ., City Hall, Negro Industrial School, $500,000. CD 8/27.

Ga., Augusta—PARKING GARAGE—City, City Hall, auto parking garage, Broad St. $712,000. CD 4/16.

▲† **Ga., Byron**—ADMINISTRATION, etc.—Sixth Naval District, Charleston, S. C., plans by Elliott Dunwoody, Macon, Mac Ewen, Hall & Ferguson, Macon, League, Warren & Riley, Macon, John J. Harte Co., Techwood Dr., Atlanta, Stevens & Wilkinson, 157 Luckie St. N.W., Atlanta, James C. Wise, 305 Techwood Dr., Atlanta and administration, maintenances shops, medical bldg., storage and supply handling, railroads, fencing and utilities at Naval Supply Depot, U. S. Rt. 41 and State Rt. 49, $9,000,000. CD 9/19.

Ga., Covington—HOSPITAL—Newton Co., Covington, hospital, $550,000.

Ga., Statesboro—HOSPITAL—Bulloch County, hospital addn. $600,000.

▲ **Ga., Waycross**—HOSPITAL—Ware Co., plans by Gregson & Ellis, Mortgage Guarantee Bldg., Atlanta, hospital, $1,000,000.

▲† **Ill., Great Lakes**—STORAGE WAREHOUSES—Ninth Naval Dist., Great Lakes Training Station, 2 storage warehouses, $2,400,000. CD 6/28/51.

Ind., Muncie—SCHOOL—School Bd., Muncie elementary school in northeast part of city $500,000.

Ky., Lexington—DORMITORY—University of Kentucky, S. Lime St., plans by John F. Wilson, Wellington Arms Apartments, men's dormitory, $750,000. CD 7/8.

Ky., Louisville—SCHOOL—Jefferson Co. Bd. Educ., 618 W. Jefferson St., plans by Fred Hartstein, McDowell Bldg., high school addn., Fern Creek, $700,000.

La., New Orleans—SCHOOL—Orleans Parish School Bd., 703 Carondelet St., plans by Dreyfous & Seiferth, Audubon Bldg., Gentilly Woods School, $580,000.

▲† **Md., Aberdeen Proving Ground**—LABORATORY and ENGINEERING—U. S. Eng., 24 St. and Maryland Ave., Baltimore, plans by Elkan W. Groll, 1830 Jefferson Pl. N.W., Wash., D. C., laboratory and engineering bldg. for development and proof service, $500,000-$1,000,000; plans by J. L. Faisant & Assoc., 21 W. 25th St., Baltimore, masonry, steel, concrete receiving and shipping bldg., $300,000.

▲ **Md., Annapolis**—OFFICE—State, Dpt. P. Wks., 506 Park Ave., Baltimore, state office bldg., $3,000,000, Harder & Dressel, Gov. Ritchie Hy., Glen Burnie, and Rogers & Taliaferro, 229 Prince George St., Annapolis, consult. engrs. CD 11/13/47.

▲ **Md., Baltimore**—SCHOOLS—City, Bureau Bldg. Constr., 410 Municipal Bldg., plans by Henry, Powell Hopkins, 10 E. Mulberry St., 3 story Southern Junior-Senior High School, Battery Ave., Warren and William Sts., $2,000,000 plans by Ross, Walton & Hofstetler, 2111 N. Charles St., Elmer A. Henderson Elementary School (colored), $1,400,000, J. L. Faisant & Assoc., 21 W. 25 St., struct. engrs., H. Walton Redmile, 2017 Maryland Ave., mech. engr.; plans by Tyler, Ketcham & Myers, 513 Park Ave., 3 story, rein.-con., brick, block L-shaped elementary school, Gleneagle Rd. and Leith Walk, $750,000; plans by Buckler, Fenhagen, Meyer & Ayers, Federal Land Bank Bldg., Zone 18, Cross Country Blvd.

Elementary School, $750,000, VanRensselaer Saxe, 1701 St. Paul St., struct. engr., Charles E. Daniel, Federal Land Bank Bldg., Zone 18, mech. engr., R. E. L. Williams, city bldg. constr. engr.

▲ **Md., Baltimore**—OFFICE—State, Bd. P. Wks., 506 Park Ave., state office bldg. $10,000,000, Palmer, Fisher & Williams & Nes, 1020 St. Paul St., and L. P. Kooken & Assoc., 2017 Maryland Ave., Zone 18, consult. engrs.

▲† **Md., Fort Ritchie**—JOINT COMMUNICATIONS—U. S. Eng., First and Douglas Sts. N.W., Wash., D. C., joint communications, Blue Ridge Summit, $1,000,000-$3,000,000.

Mich., West Bloomfield—SCHOOL—West Bloomfield Twp. School Bd., brick, steel high school, $600,000. CD 8/8/50.

Minn., Grand Rapids—HOSPITAL—Itasca County, c/o Memorial Hospital Bd., Grand Rapids, $750,000 bond election Nov. 4, hospital.

Minn., St. Paul—HOSPITAL—Welfare Bd., City of St. Paul and Ramsey Co., 179 Court House, rehabilitation of Ancker Hospital, 495 Jefferson St. $500,-000. CD 12/12/45.

▲ **Mo., Liberty**—HOSPITAL—Clay Co. membership Hospital Assn., c/o Alan F. Wherrit, 100-bed hospital, $1,500,000. CD 10/9.

Mont., Missoula—SCHOOL—Missoula Co. Bd. Educ., Missoula, high school, $500,000. CD 5/13.

▲ **Neb., Lincoln**—DORMITORIES—University of Nebraska, Lincoln, plans by Davis & Wilson, 225 Stuart Bldg., 2 dormitories. $2,000,000. CD 4/18/51.

Neb., Superior—HIGH SCHOOL—Bd. Educ., Superior, $560,000 bond election Nov. 4, high school. CD 6/6/51.

▲† **N. J., Belle Mead**—SHOP, etc.—U. S. Eng., 80 Lafayette St., New York, 13, N. Y., plans by Erwin Gerber, 1180 Raymond Blvd., Newark, N. J., base maintenance shop and warehouses. $1,000,000-$3,000,000; and box shop and engineer maintenance shop, $1,000,000-$3,000,000. CD 9/14/51.

▲† **N. J., Fort Monmouth**—WAREHOUSE—U. S. Eng., 80 Lafayette St., New York, 13, N. Y., plans by Greenberg & Ames, 565 Fifth Ave., New York, N. Y., warehouse buildings, $500,000-$1,000,000; plans by The Ballinger Co., 121 N. Broad St., Phila., Pa., Signal Corps R and D Laboratory, Second Section, $5,000,000. CD 2/19.

† **N. Y., Malta**—FACILITIES, etc.—U. S. Eng., 80 Lafayette St., New York, Zone 13, misc. facilities, $100,000-$500,000; steel water supply tank, $100,-000, both at Hermes Project. Alexander Potter, 50 Church St., New York, Zone 7, engr. CD 11/30/50.

† **N. Y., West Point**—LIBRARY—U. S. Eng., 80 Lafayette St., New York, Zone 13, plans by Magoon & Salo, 366 Madison Ave., New York, Zone 17, library alteration at U. S. Military Academy. $100,000-$500,000.

N. C., Charlotte—LIBRARY—Comrs. Mecklenberg Co., Court House, bond election Dec. 5, library, $800,000.

▲ **N. C., Charlotte**—SCHOOL IMPRVS. Comrs. Mecklenberg Co., Court House, bond election Dec. 5, school imprvs. $7,500,000.

N. C., Goldsboro—HOUSING—Goldsboro Housing Auth., Goldsboro, 115-unit housing addn. to Fairview Homes for Whites. $750,000.

O., Columbus—SCHOOL—Upper Arlington Schools Bd. Educ., 2100 N. Devon Rd., Zone 12, $550,000 bond election Nov. 4, 2 story, brick, concrete, steel Tremont Road School addn.

▲ **Okla., Oklahoma City**—HIGH SCHOOL—Bd. Educ., 400 N. Walnut St., plans by Hudgins, Thompson & Ball, 1100 W. Main St., Classen High School, N. W. 27 and May Sts. $3,000,000. CD 3/31.

† **Pa., Marietta**—WAREHOUSE—U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md., plans by Buchart Eng. Corp., engrs. and archts., York, storage facilities warehouse, Marietta Transportation Corps Depot. $500,000.

R. I., Barrington—SCHOOL—Town, plans by Howe, Prout & Ekman, 17 Custom House St., Providence, elementary school. $500,000.

▲ **S. C., Charleston**—TERMINALS—South Carolina State Ports Auth., 1 Vendue Range, expansion Columbus Street Terminals. $9,000,000. Lockwood-Green Engineers, Spartanburg, consult. engrs. CD 1/31/45.

▲ **Tenn., Chattanooga**—OFFICE—Hamilton Co., Court House and City, City Hall, plans by Bianculli, Palm & Purnell, Volunteer State Life Bldg., office, $2,000,-000.

Tenn., Chattanooga—OFFICE—State Hy. Dpt., Nashville, district office bldg. $600,000.

Tex., Hondo—DWELLINGS—Federal Housing Admin., 911 Texas & Pacific Bldg., Fort Worth, plans by G. Van Maltsberger, 2013 Belknap Pl., San Antonio, 100 portable type 3-bedroom dwellings. $600,000. CD 10/14.

† **Va., Fort Belvoir**—SHOP, etc.—U. S. Eng., 1st and Douglas Sts., Wash., D. C., plans by Frishman & Manuel, 619 Pennsylvania Ave. N. W., Wash., D. C., field maintenance shop, $100,000-$500,000; plans by Wiley & Wilson, Lynchburg, Va., outside utilities and roads, EM BKS area, $100,000. CD 7/17.

Va., Prince George—HIGH SCHOOL—Prince George County School Bd., Prince George, Consolidated High School, Disputanta. $500,000. Charles W. Smith, c/o owner, supt. Schools.

Wash., Moses Lake—HOSPITAL—Moses Lake Hospital Dist., Moses Lake, plans by H. A. Hovind, 1500 Westlake Ave. N., Seattle, and C. Martell, Fernwell Bldgs., Spokane, hospital, $620,000. CD 9/24.

B. C., Burnaby—MUNICIPAL HALL—Municipality of Burnaby Municipal Hall, plans by Y. Cullerne & G. N. Evans, 119 W. Pender St., 2 story, part 3 story, rein.-con. municipal hall, $665,000.

▲ **Ont., Toronto**—LIBRARY—University of Toronto, Simcoe Hall, plans by Mathers & Haldenby, 15 St. Mary St., 2 story, 2 bsmnts, with sun deck library, $2,000,000. CD 11/19/51.

COMMERCIAL BUILDINGS

▲ **Ga., Augusta**—APARTMENT—Harry Hammond & H. G. Barrett, 135 8 St., 150-unit apartment. $2,000,000.

▲ **Ga., Savannah**—DEPARTMENT STORE—Levy's, Inc., Abercorn and Broughton Sts., plans by Levy & Kiley, Realty Bldg., department store addn. $1,100,000. CD 8/29.

Ill., Melrose Park—HOSPITAL—Westlake Hospital, 612 N. 12 St., plans by Childs & Smith, 20 N. Wacker Dr., Chicago, Zone 6, hospital addn. $650,000.

Ia., Indianola—DORMITORY—Simpson College Indianola, plans by Poundstone, Ayres & Godwin, 211 Bona Allen Bldg., Atlanta, Ga., 1 men's dormitory and student union bldg. $600,000. CD 10/3.

▲ **Ky., Camp Breckenridge**—HOUSING—Public Housing Admin., Housing & Home Finance Agency, 900 N. Lombardy St., Richmond, Va., plans by Fred Hartstein, McDowell Bldg., Louisville, Zone 2, Sect. 2, temporary housing for military personnel. $1,000,000.

▲ **Ky., Louisville**—OFFICE—The Insurance Center, Inc., c/o Joseph & Joseph, archts., Speed Bldg., remodeling theater into office, 326 W. Chestnut St., $1,000,-000. E. R. Ronald & Assoc., 554 S. Third St., consult. engrs. CD 10/16.

Ky., Louisville—EDUCATIONAL—Walnut Street Baptist Church, Third and St. Catherine Sts., plans by Jos. H. Kolbrook, Starks Bldg., 4 story, stone, masonry educational bldg. $500,000. E. R. Ronald & Assoc., 554 S. Third St., consult. engrs.

▲ **Ky., Owensboro**—DORMITORIES—Kentucky Wesleyan College, Owensboro, 2 dormitories (2nd unit); chapel, auditorium and library; 2 dormitories (3rd unit) gymnasium. $4,000,000.

▲ **Mich., Battle Creek**—HOSPITAL—Community Hospital, Battle Creek, plans by Lewis J. Sarvis, 258 Champion St., 5 story, bsmnt., brick, rein.-con., community hospital addn. $1,000,000. Plans deposit $20. W. H. Wheeler, Metropolitan Bldg., Minneapolis, Minn., engr. CD 5/20.

Mich., Detroit—CHURCH—St. Jude's R. C. Parish, 15879 E. Seven Mile Rd., plans by Arthur Des Rosier, 15850 James Couzens Dr., 2 story, bsmnt., brick, steel, stone church and tower, East Seven Mile Rd. near Kelly Rd. $800,000. CD 10/8.

Minn., Rochester—DEPARTMENT STORE—Allied Stores, Inc., c/o L. S. Donaldson Co., Sixth St. and Nicollet Ave., Minneapolis, plans by Park Center Corp., Rochester, 160x200 ft., three level branch department store. $500,000.

Mo., Marshall—HOSPITAL—Fitzgibbon Memorial Hospital, 868 S. Brunswick St., plans by Gentry & Voss camp, 4 W. 13 St., Kansas City, Mo., hospital addn. $500,000.

Mo., St. Louis—HOSPITAL—Barnard Free Skin & Cancer Hospital, John R. Shepley, pres., 3427 Washington Ave., Zone 3, plans by Russell, Mullgardt, Schwarz, Van Hoefen, 1620 Chemical Bldg., 721 Olive St., Zone 1, 4 story, ground oor, 45x128 ft., brick, rein.-con., cancer hospital to be incl. Barnes Hospital group near Kingshighway and Euclid Ave., $600,000. Brussel & Viterbo, Arcade Bldg., 812 Olive St., Zone 1, struct. engrs. CD 11/4/48.

N. Y., Brooklyn—BANK—Fulton Savings Bank, 375 Fulton St., plans by Benjamin Moscowitz, 205 E. 42 St., New York Zone 17, bank, 389-97 Jay St. $600,000.

▲ **N. Y., Fort Jay**—HOUSING—U. S. Eng., 80 Lafayette St., New York, Zone 13, construct, manage, finance, 75 unit housing. $500,000-$1,000,000.

N. Y., New York—APARTMENT—Samuel Sumers, Inc., 430 Tiffany St., plans by Morris Rothstein, 186 Joralemon St., Brooklyn, Zone 2, 6 story apartment, 239 St. and Blackstone Ave. $625,000.

N. C., Fort Bragg—HOUSING—Federal Housing Admin., Greensboro, 100 defense housing units. $800,000.

▲ **O., Cleveland**—LIBRARY—Western Reserve University, University Circle, library, East Boulevard and Bellflower Rd. $1,000,000. CD 5/31/50.

▲ **Okla., Oklahoma City**—RESIDENCES—Park Estates Corp., Liberty Bank Bldg., 150 unit residential development, N.E. 50 and Kelley Sts., $500,000; 175 unit residential development, N.E. 36 and Kelley Sts., $750,000. J. B. Scoggins, c/o owner, engr.

▲ **Pa., Rosemont**—APARTMENT—Mrs. Elizabeth Magen, 7 Derwen Rd., Wynnewood, apartment. $2,500,-000.

▲ **S. C., Greenville**—COLLEGE GROUP—Furman University, President's Office, Greenville, plans by Perry, Shaw & Hepburn-Kehoe & Dean, 31 St. James Ave., Boston, Mass., college group. $23,000,000. CD 5/10/45.

▲ **Tenn., Nashville**—BANK—Federal Reserve Bank, Nashville Branch, 226 3rd Ave. N., bank. $1,000,000.

Tex., Big Spring—OFFICE—Gus Cooley, 2026 Ward Parkway, Fort Worth, plans by David S. Castle Co., engrs. and archts., 1082½ N. 1st St., Abilene, 6 story office. Approx. $750,000.

▲ **Tex., Dallas**—OFFICE—Leo F. Corrigan, Mercantile Bank Bldg., plans by White & Prinz, 1330 N. Industrial Blvd., 40 story office. $10,000,000. Chappell & Brenneke, Burt Bldg., consult. engrs. CD 10/14.

▲ **Tex., Dallas**—DWELLINGS—Leslie Hill & Assoc., 2722 Lawrence St., Group 1, 35 brick, dwellings, concrete slab fdn. $350,000; Group 2, 50 brick, masonry dwellings, concrete slab fdn., air-conditioning, $475,000; Group 3, 30 masonry, frame dwellings, concrete slab fdn. $325,000; Group 4, 35 masonry dwellings, concrete slab fdn. $345,000; Group 5, 45 brick dwellings, concrete slab fdn., $440,000; Group 6, 38 brick, stone trim dwellings, concrete slab fdn., $390,000; Group 7, 60 frame, masonry dwellings, concrete slab fdn., air-conditioning, $625,-000; Group 8, 54 brick and stone dwellings, concrete slab fdn., $560,000; in an area of Casa View Oaks Addition. CD 7/10/50.

▲ **Tex., Dallas**—CHAPEL—Northridge Presbyterian Church, 6920 Bob-O-Link St., chapel, education-youth bldg. addn. $5,000,000.

▲ **Tex., Dallas**—STUDENT UNION—Southern Methodist University, plans by George F. Pierce, Jr., 4601 Montrose St., Houston, student union, 72,000 sq. ft. $1,500,000. CD 8/25/49.

Tex., Houston—HOSPITAL—Heights Hospital, Ashland and 20 Sts., plans by Golemon & Rolfe, 5100 Travis St., 32-bed brick, concrete, steel hospital annex, $500,000; heating and power plant expansion, $90,-000. Walter P. Moore, 4605 Montrose Blvd., and Howard & Johnson, Scanlan Bldg., consult. engrs.

Tex., Houston — DWELLINGS — Zabolio Bros., 2120 Peckham St., plans by F. Perry Johnston, 3908 Main St., 50 masonry, frame dwellings, off Market St. Rd. $500,000. CD 11/14/49.

▲ **Tex., Pasadena**—DWELLINGS—King Bros., 17 Rivercrest St., Houston, Unit 1, 38 frame dwellings, $310,000; Unit 2, 75 frame dwellings, $525,000; Unit 3, 40 dwellings, concrete pier fdn. $335,000; Unit 4, 60 frame, masonry trim dwellings, $435,000; Unit 5, 50 frame, knotty pine paneling dwellings, concrete slab fdn. $390,000; Unit 6, 85 various types dwellings, $675,000, near here.

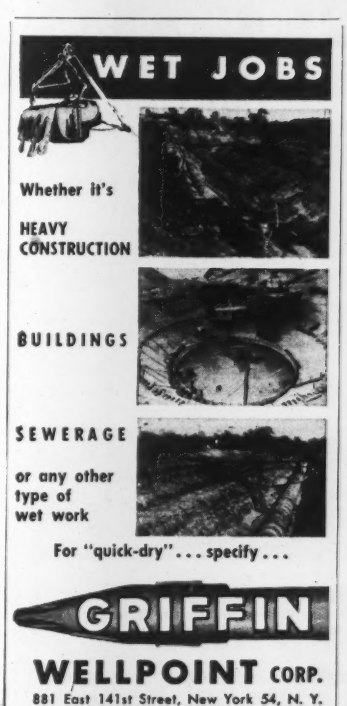
Tex., San Antonio—MOTELS—Joseph Carmack Corp., 1400 Blk. Austin Hy., 108-room expansion of Aloha Motel on, $350,000; luxurious ultra-modern motel units, $500,000, both off Austin Hy.

▲ **Utah, Salt Lake City**—HOME—Church of Jesus Christ of Latter Day Saints, 47 E. South Temple St., plans by E. O. Anderson, c/o owner, home for the Church Relief Society. $1,000,000. CD 10/15/47.

Va., Norfolk—SCHOOL—Blessed Sacrament Catholic Church, 822 W. 37 St., plans by Joseph B. Courtney, 424 W. 21 St., Catholic Elementary School. $500,000.

▲ **Alaska, Anchorage**—OFFICE—Jack Henry Post No. 1, American Legion, Anchorage, 7 story, bsmnt. office. $2,000,000.

▲ **Alaska, Fairbanks**—HOTEL—Philip Johnson et al, c/o Bank of Fairbanks, Fairbanks, 150-room hotel. $1,100,000.



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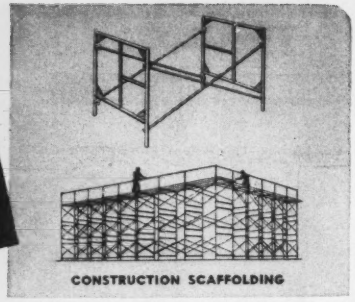

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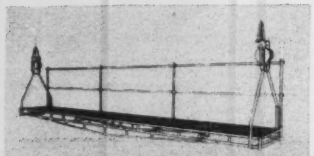

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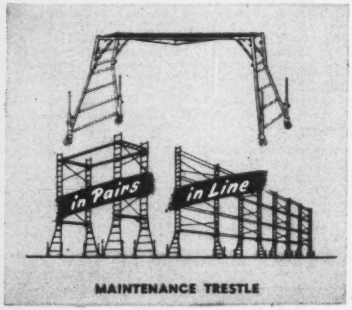

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N. S., Halifax—OFFICE—Maritime Life Assurance Co., 49 Sackville St., plans by C. A. Fowler & Co., Capitol Theatre Bldg., 2 story, head-office bldg., Spring Garden Rd. and Prince St. $500,000. CD 3/17/49.

INDUSTRIAL BUILDINGS

Ala., Birmingham—PLANT—John Merritt, 11 Ave. and 32 St., plant. $500,000.

▲ **Kan., Merriam**—WAREHOUSE—Western Electric Co., c/o T. C. Morris, br. mgr., 3533 Roanoke Rd., Kansas City, Mo., 200,000 sq. ft. distribution warehouse. $1,500,000.

▲ **Mo., Joplin**—PLANT—Missouri Farmers Assn., Columbia, fertilizer plant, $3,500,000.

▲ **Mo., Pagedale** (St. Louis 14 P. O.)—PLANT, etc.—Huttig Sash & Door Co., 1218 S. Vandeventer Ave., St. Louis, Zone 10, 1 story, brick, concrete, steel, 140,000 sq. ft. sash and door mfg. plant and warehouse facilities, offices, etc. on 14 acre site, 8900 Block Page Ave. $1,000,000.

▲ **N. Y., Syracuse**—PLANT—Solvay Process Div., Allied Chemical & Dye Corp., 61 Broadway, New York, Zone 6, soda ash facilities at existing plant. $10,000,000.

N. C., Greenville—PLANT—Greenville Industries, Inc., Greenville, plant. $500,000.

Okla., Tulsa—SERVICE STATION, etc., Oklahoma Natural Gas Co., 624 S. Boston St., service station and warehouse, 15 and Yale Sts. $500,000. W. R. Kubista, c/o owner, engr.

Tex., Hawkins—PLANT—Natural Gasoline Corp., Hawkins, gas plant expansion $750,000.

▲ **Tex., Houston** — WAREHOUSING, etc. — Houston Oil Field Materials Co., 1524 Maury St., warehousing and shops, 70-acre tract off Main St. $1,000,000. CD 6/5.

▲ **Tex., Houston**—SHOPS, etc.—Southern Pacific Lines, L. A. Loggin, ch. engr., Southern Pacific Bldg., shops expansion and imprvs. $750,000; roundhouse imprvs., approx. $350,000. CD 11/12/51.

▲ **Va., Richmond**—WAREHOUSE—Thalhimer Bros., Inc., Broad and 6 Sts., warehouse. $2,000,000.

Wis., Milwaukee — STORAGE — Pabst Brewing Co., 917 W. Juneau Ave., Zone 3 96x96 ft. 180 ft. high concrete malt and grain storage bldg. $500,000. E. Lee Heindereich Jr., Newburgh, N. Y., consult. engr.

▲ **Que., Cap de la Madeleine**—REFINERY—Boreal Rare Metals Ltd., 265 Craig St. W., refinery, Boucher St. $1,000,000.

UNCLASSIFIED

▲**Calif., Riverside**—PARKS—City, 3606 7 St., bond election Nov. 18, parks. $1,000,000. M. H. Irvine, c/o owner, engr.

Conn., Hartford—TELEVISION STATION—Connecticut Broadcasting Co. (WDRC), 750 Main St., television station. $454,000. Paul Godley Co., Old Quarry Rd., Upper Montclair, N. J., consult. engr.

Conn., Hartford—TELEVISION STATION—General Teleradio Inc., 1440 Broadway, New York, 36, N. Y., television station. $476,000.

▲ **Fla., Miami**—TELEVISION STATION—Storer Broadcasting Co. (WGBS), 199 Pierce St., Birmington, Mich., television station, $1,250,000. A. Earl Cullum, Jr., 4710 Lemmon Ave., Dallas, Tex., consult. engr.

Fla., St. Petersburg—TELEVISION STATION—Pinellas Broadcasting Co. (WTSP), 440 First Ave. S., television station. $540,000.

Ill., Chicago—TELEVISION STATION—Zenith Radio Corp. (WEFM), 6001 Dickens Ave., Chicago, Ill., television station, $564,000.

Ind., Indianapolis—TELEVISION STATION—WIBC, Inc. 30 Washington St., television station, $739,000. A. Earl Cullum, Jr., 4710 Lemmon Ave., Dallas, Tex., consult. engr.

Kan., Wichita—TELEVISION STATION—Taylor Radio & Television Corp. (KANS), 101 S.N. Broadway, television station, $816,000, A. Earl Cullum, Jr., 4710 Lemmon Ave., Dallas, Tex., consult. engr.

Louisiana—RURAL DISTRIBUTION LINES—Valley Electric Membership Corp., Natchitoches, 380 mi. rural distr. lines, sys. imprvs., Grant Co. $765,000.

La., Shreveport—TELEVISION STATION—International Broadcasting Corp., P.O. Box 1387 (KWKH), Commercial Bldg., television station, $832,000, A. Earl Cullum Jr., 4710 Lemmon Ave., Dallas, Tex., consult. engr.

▲ **Md., Baltimore**—PIER—Pennsylvania R.R. Co., L. P. Struble, ch. engr., 30 and Market Sts., Phila., Pa., replacing 1,100 ft. Pier 5, Clinton St., Canton area of Baltimore in conjunction with Port of Baltimore Comn. $9,000,000. CD 2/9/50.

S. C., Florence — TELEVISION STATION — Jefferson Standard Broadcasting Co., c/o Melvin Purvis, Florence, television station, $500,000.

▲ **Tex., Houston**—SWITCHING YARDS, etc.—Southern Pacific Lines, L. A. Loggins, ch. engr., Southern Pacific Bldg. Houston, switching yards and trackage imprvs. $1,000,000.

▲ **WASHINGTON**—PETROLEUM PRODUCTS PIPE LINE —Standard Oil of California, 225 Bush St., San Francisco, Calif., 140 mi. 8 in. petroleum products pipe line from Pasco to Spokane, Franklin, Adams and Spokane Counties, $4,500,000.

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
November 4 Massachusetts November 5 Rhode Island

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Platt Constr. Co., Inc.**, 99 First St., Cambridge, Mass. CA. **$1,872,000.** est. $1,250,000. NO-A 1147, Laboratory, Hanscomb Airport, BEDFORD, MASS. P. Wks. Office, 495 Summer St., Boston, Mass. and Raytheon Mfg. Co., Waltham, Mass., prime contractor. CD 9/19, under LB.

Thos. Constr. Corp., Wilson Ave., Kingston, N. Y. LB $995,860, est. $750,000. Contr. 153, Framingham Trunk interceptor Sewer Sect. No. 133, South Metropolitan System, Natick, BOSTON, MASS. State, Metropolitan Dist. Comn., Sewerage Div., 20 Somerset St., Boston, Mass. Bids Oct. 16. CD 10/1.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
November 6 New Jersey November 12 Maryland

▲† **N. Y., Rome**—LABORATORY—B.A. On Or About 11/25—U. S. Eng., 80 Lafayette St., New York, Zone 13, aerial reconnaissance laboratory, Serial No. ENG 30-075-53-128. $2,300,000. Plans deposit $25.

▲† **N. Y., Syracuse**—FACILITIES—B.A. About 2/10—U. S. Eng., 80 Lafayette St., New York, Zone 13, Air National Guard Facilities, paving and building at Hancock Field. $1,000,000-$5,000,000. Mayer & Whittlesey, 31 Union Square, New York, Zone 3, archts.

BIDS ASKED—BUILDINGS

▲ **N. Y., Hicksville**—SCHOOL—B.A. After 10/25—Bd. Educ., Union Free School Dist. 17, Hicksville High School, Jerusalem Ave., elementary school. $1,000,000.

Pa., Linesville—HIGH SCHOOL—B.A. 11/5—Linesville, Conneaut & Summit Joint School Dist., Linesville, brick and block Junior-Senior High School. $900,000. W. G. Eckles, Lawrence Saving & Trust Bldg., New Castle, archts. CD 10/25/51.

Pa., Seneca—HIGH SCHOOL—11/6—Joint School Dist. of Cranberry and Pine Grove Twps., Seneca, 2 story, bsmnt., 2 wings, 111x60 and 60x60 ft., brick, tile high school addn., alterations. $800,000. Wm. Holmes Crosby, 49 Maple Ave., Oil City, engr. CD 5/27.

▲ **N. Y., Bayside**—SCHOOL—B.A. 11/10—Co-ordinator of School Constr., 49 Flatbush Ave. exten., Brooklyn, Zone 1, general constr., plumbing and drainage; heating and ventilating; electrical work and lighting fixtures for P. S. 205, east side of Bell Blvd., 75 Ave., 217 St. and 77 Ave., Queens Boro. $1,711,730. Plans deposit $20 general constr.; $10 each mechanical.

▲ **N. Y., Brooklyn**—HIGH SCHOOL—B.A. 11/14—Co-ordinator of School Constr., 49 Flatbush Ave. exten., Zone 1, general constr., plumbing and drainage; heating and ventilating; electrical work and lighting fixtures for new Junior High School 57, Stuyvesant and Lafayette Sts. $3,187,500. Plans deposit $26 general contr., $10 each mechanical. CD 9/10.

▲ **Pa., Armagh**—HIGH SCHOOL—B.A. 11/17—United Joint School Dist., Armagh, high school. $1,768,000. Plans deposit $25. Hunter, Caldwell & Campbell, 3601 5th Ave., Altoona, archts. CD 10/9.

▲ **N. Y., Flushing**—HIGH SCHOOL—B.A. 11/18—Co-ordinator of School Constr., 49 Flatbush Ave. exten., Zone 1, general constr., elevator installation, plumbing and drainage, heating and ventilating, electrical and lighting fixtures for Flushing High School Addn. $2,985,900. Plans deposit $27 general constr. $5 elevator installation, $11, each, plumbing and drainage, electrical and lighting fixtures, $10 heating and ventilating. CD 10/21/48.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **PENNSYLVANIA**—State Hy. & Bridge Auth., 506 North Office Bldg., Harrisburg.

Francis A. Canuso & Sons, 173 W. Roosevelt Blvd., Phila., Pa., CA **$1,199,970.** constr. 14,060 ft. c.-conc. pavement 33 ft. wide, with bit. surf., crushed aggregate base, widen West Chester Pike, Delaware Co. Bids Aug. 15. CD 8/19, under LB.

▲† **Lycoming Constr. Co., Inc.**, 127 Susquehanna St., Williamsport, Pa., LB, **$1,460,000,** base supply warehouse and air freight terminal, Dover Air Force Base, DOVER, Del. U. S. Eng., 121 N. Broad St., Phila., Pa. Bids Oct. 10. CD 10/7.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Caristo Constr. Co.**, 26 Court St., Brooklyn, N. Y. CA. **$1,219,000** Alt. A, concrete for new SCHOOL, P. S. 191, E. Williston Ave. between 258 and 259 Sts., BELLEROSE, N. Y. Co-ordinator of School Constr., 49 Flatbush Ave. exten., Brooklyn, 1, N. Y. Bids Sept. 16. CD 9/23, under LB.

▲ **True Value Estates**, c/o Teas & Steinbrenner, archts., Homeland Bldg., Malverne, N. Y. Owner Builds. $5,000,000. 425 HOUSES on 92 acre tract on south side of Old Country Rd., BETHPAGE, N. Y.

▲ **Kings Oaks Terrace Co-operative Apartments Corp.**, 17 Neptune Ave., Brooklyn 29, N. Y., Separate Contracts. $1,176,000. two APARTMENTS, 915 E. 7 St. and 840 E. 8 St., BROOKLYN, N. Y. CD 7/17.

▲ **D.M.W. Constr. Co.**, 2058 Fulton St., Brooklyn 33, N. Y. CA. **$2,847,000,** general contract for Brevoort Houses, Proj. No. NY 5-17, in area bounded generally by Marion St., Ralph Ave., Fulton St. and Patchen Ave., Brooklyn Boro, BROOKLYN, N. Y. New York City Housing Auth., 63 Park Row, New York 38, N. Y. Bids Aug. 26. CD 8/28, under LB.

▲ **East Hills Estates**, c/o Matern & York, archts., 90-04 161 St., Jamaica, N. Y. Owner Builds. $4,000,000. 300 HOUSES on 50-acre tract at Hempstead Turnpike and Merritt Rd., FARMINGDALE, N. Y.

▲ **Caristo Constr. Corp.**, 26 Court St., Brooklyn 2, N. Y., CA **$1,167,000.** SCHOOL, P. S. 201, 155 and 156 Sts., 90 ft. south of 65 Ave., FLUSHING, N. Y. Co-ordinator of School Constr., 49 Flatbush Ave. exten., Brooklyn 1, N. Y. Bids Sept. 15. CD 10/14, under LB.

▲ **Samuel Lefrak**, 97-27 64 Rd., Forest Hills, N. Y. Owner Builds. Approx. $1,000,000. 6 story APARTMENT, Yellowstone Blvd. between Burns and Clyde Sts., FOREST HILLS, N. Y. CD 6/26.

Ellis Chingos Constr. Co., Albertson, N. Y., CA **$717,000,** 2 grade SCHOOLS, Grace Ave. and Clover Dr., GREAT NECK, N. Y. Bd. Educ. Union Free School Dist. 7, 345 Lakeville Rd., Lake Success, N. Y. Bids Sept. 23. CD 9/10.

▲ **H.R.H. Constr. Co.**, 9 E. 40 St., New York 17, N. Y. CA. **$4,293,000.** general contract;

Heating Maintenance Corp. of New York, 220 E. 138 St., New York 51, N. Y. CA. **$642,860,** heating and ventilating for South Jamaica HOUSES II (Proj. NY-5-18) in area bounded generally by 158 St., 109 Ave., 159 St., 108 Ave., 107 Ave., 159 St., 158 St., South Rd., 160 St. and Brinkerhoff Ave., JAMAICA, N. Y. New York City Housing Auth., 63 Park Row, New York 7, N. Y. Bids July 15. CD 7/18, under LB.

▲ **Willcox Constr. Co., Inc. and James McHugh Constr. Co., Inc.**, 29-28 41 St., Long Island City, N. Y. CA. **$3,753,990,** general contract St. Nicholas HOUSES, Proj. No. NY 5-10, Sect. III, incl. Bldgs. No. 8 to 13 (inclusive) in area bounded generally by W. 131 St., 7 Ave., W. 129 St. and 8 Ave., Manhattan Boro, NEW YORK, N. Y. New York City Housing Auth., 63 Park Row, New York 7, N. Y. Bids Aug. 5. CD 8/12, under LB.

▲ **S. S. Silberblatt, Inc.**, 25 W. 45 St., New York, 19, N. Y., LB, **$4,157,100,** general contract;

Jarcho Bros., Inc., 306 E. 45 St., New York, 17, N. Y., LB, **$512,447,** heating and ventilating;

Eugene Duklauer, Inc., 215 E. 38 St., New York, 16, N. Y. LB, **$489,331,** plumbing for Forest HOUSES Proj. No. NYS 57, Section I, incl. Bldgs. 1 to 7 (inclusive) in area bounded generally by E. 166 St. Tinton Ave., E. 165 St., Jackson Ave. E. 163 St. and Trinity Ave., Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., 63 Park Row, New York 38, N. Y. Bids Oct. 21. CD 10/2.

▲ **Paul Tishman Co., Inc.**, 21 E. 70 St., New York 21, N. Y. LB **$3,638,900,** generaal constr.;

Afgo Eng. Corp., 475 Adelphi St., Brooklyn 17, N. Y. LB **$461,600,** heating;

Arc Electrical Constr. Co., Inc., 739 Second Ave., New York 16, N. Y. LB **$202,200,** electrical work;

Far Plumbing Co., 2018 Crotona Parkway, New York 60, N. Y. LB **$355,555,** plumbing for Jefferson HOUSES, Proj. No. NY 5-16, Sect. I, incl. Bldgs. 1 to 6 (inclusive) as well as boiler room, coal storage garage, community center and children's center in area bounded generally by W. 115 St., 1st St., E. 113 St., 2d Ave., Manhattan Boro, NEW YORK, N. Y. New York City Housing Auth., 63 Park Row, New York 7, N. Y. Bids Oct. 15. CD 9/25.

Cranbrook Manor Homes, c/o C. Frederic Doriot, S-111 Paramus Rd., Paramus, N. J., Owner Builds, **$900,000,** 65 HOUSES on tract on Ehret Street north of Route 4, PARAMUS, N. J.

United Constr. Co., 1204 Lincoln Ave., Pittsburgh, Pa. LB. **$896,000.** 8 two and three story 130 family HOUSING, CLAIRTON, PA. Allegheny Co. Housing Aut., County Office, Pittsburg, Pa. Bids Oct. 9. CD. 9/25.

▲ **Montgomery Constr. Co.**, 803 W. Main St., Grove City, Pa., CA. **$1,190,000,** general constr., Senior HIGH and ELEMENTARY SCHOOL bldg. for Grove City Joint School Dist., GROVE CITY, PA. State Public School Bldg. Auth., 101 S. 25 St., Harrisburg, Pa. Bids Sept. 25. CD 10/1, under LB.

▲**Starrett Bros. & Eken**, 63 Wall St., New York, N. Y. CA. Approx. $1,000,000. Research LABORATORIES, Churchill Boro, PITTSBURGH, PA. Westinghouse Electric Corp., Union Bank Bldg., Pittsburgh, Pa. CD 7/31.

▲ **F. H. Martell Co., Inc.**, 1023 20 St. N. W., Wash., D. C. CA **$2,541,600.** 1 and 2 story, brick, steel, concrete, cinder block, Wheaton High SCHOOL, near Wheaton, ROCKVILLE, MD. Montgomery Co. Bd. Educ., Rockville, Md. CD 10/14, under CA.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
November 7 Kentucky

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Irons & Reynolds**, 1724 H St. N. W., Wash., D. C., CA **$1,368,990.** 7 barracks, Naval Aviation Ordnance Test Station, Naval Air Facilities, NOY 74875, Spec. 35788, CHINCOTEAGUE, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. CD 10/7, under LB.

▲† **Diamond Constr. Co.**, P. O. Box 1007, Norfolk, Va. CA **$1,064,049.** Small boat basin, Naval Amphibious Base, NOY 72490, Spec. 33662, LITTLE CREEK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. CD 10/3, under LB.

▲† **Bero Eng. & Constr. Co.**, P.O. Box 477, Hampton, Va. LB **$2,650,000.** roads, walks and utilities, Naval Auxiliary Air Station, NOY 74837, Spec. 35774, OCEANA, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. Bids Oct. 21. CD 10/7.

▲† **Virginia Eng. Co., Inc.**, 29 St. and James River, Newport News, Va., LB **$1,273,000.** operations bldg., garage and supply bldg., Naval Auxiliary Air Station, NOY 74836, Spec. 35773, OCEANA, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. Hayes, Seay, Mattern & Mattern, 410 Coulter Bldg., Roanoke, Va. and Harley, Ellington & Day, 253 E. Elizabeth St., Detroit, Mich., engrs.-archts. Bids Oct. 21. CD 9/17.

▲† **Henry C. Beck Co.**, 514 First Natl. Bldg., Atlanta, Ga., CA. **$2,756,988.** Aircraft maintenance hangar NOY 29423, Spec. No. 3111, CHERRY POINT, N. C. P. Wks. Office, Box 365, Naval Base, Charleston, S. C. Bids Sept. 24. CD 9/30 under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **Shelby Constr. Co.**, 1106 Canal St., New Orleans, La., CA, **$4,487,033,** facilities for Chemical Corps Training Command, ENG 01-076-52-72, FORT MCCLELAND, ALA. U. S. Eng., P. O. Box 1169, Mobile 7, Ala. Bids Oct. 9. CD 10/14, under LB.

▲ **Forbes & Taylor**, 361 Boiling Springs Dr., Louisville, Ky. LB **$1,240,000.** Complete combination bld.,

Verville Constr. Co., Jersey Ridge Rd., Maysville, Ky. LB **$698,900.** General contract only 18 buildings, 100 HOUSING units, roads, sewers, mechanical bids, KY 17-1 and KY 17-2, MAYSVILLE, KY. Maysville Municipal Housing Comn., Maysville, Ky. Bids Oct. 16. CD 10/2.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Ill., Libertyville**—SCHOOL — B.A. 11/19—School Dist., 120 W. Park St., 2 story, bsmnt., steel, brick High School, $1,700,000. Childs & Smith, 20 N. Wacker Dr., Chicago, Zone 6, engrs. CD 4/15.

▲ **O., Youngstown**—Y.M.C.A. BUILDING—B.A. About 12/1—Young Men's Christian Assn., 17 N. Champion St., 7 story addn. Central Y.M.C.A. Bldg., N. Champion St. $1,000,000. Damon Worley, Samuels & Assoc., 215 Lincoln Ave., archts. CD 4/1/52.

▲ † **Peter Kiewit Sons's Co.**, P. O. Box 268, Portsmouth, O., general contractor for the gaseous diffusion plant for the Atomic Energy Commission wishes to receive information from interested contractors to undertake buildings and facilities construction work on price fixed bases on 6,500 acre tract on Scioto River, Pike County between PIKETON and WAKEFIELD, O. CD 8/13, under CA.

SOON LETS CONTRACT—BUILDINGS

▲ **Ill., Chicago**—APARTMENT, etc.—Shaw, Metz & Dolio, assoc. archts., 208 S. La Salle St., Zone 4, soon lets contract 60-unit 17 story, concrete frame apartment and garage, for Donald Faster, 10 S. La Salle St., Chicago 3, Ill. $1,000,000. Christopher J. Chamales, 11 S. La Salle St., Chicago 3, Ill., archt. CD 9/23, under LB

▲ **Ill., Chicago**—ENGINE PLANT—Ford Motor Co., 3000 Schaefer Highway, Dearborn, Mich., soon lets contract substructure for engine plant 7401 S. Cicero St. $4,500,000. Albert Kahn Assoc. Architects & Engineers, Inc., New Centre Bldg., Detroit, Mich., archt. CD 10/9.

▲ **Mich., Saginaw**—FACTORY—Saginaw Steering Gear Div. General Motors Corp., 628 N. Hamilton St., soon lets contract brick, steel, concrete factory incl. 100x750 ft. main bldg. covering 450,000 sq. ft. floor space, $5,000,000. Total cost $25,000,000, incl. equip. Argonaut Realty Div. General Motors Corp., General Motors Bldg., Detroit, engrs. CD 8/26.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—Ohio Turnpike Comn., 361 East Broad St., Columbus, Zone 15,

The Horvitz Co., Midland Bank Bldg., Cleveland, O., CA **$1,163,433,** substructure of 2,700 ft. twin bridges across Cuyahoga River, Summit Co. Bids Oct. 15, awarded Oct. 18. CD 10/20, under LB.

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,

Ferguson & Edmondson Co., 407 Keystone Bldg., Pittsburgh, Pa., LB **$1,688,446,** est. $1,593,000, Type

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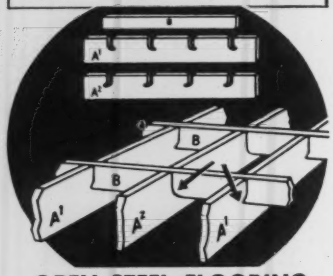

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T-50 on B-71 and structures 0.771 mi. SR 4[illegible] (3.35-3.65); SR 169-(2.14-2.74), U-UG-635 (4), U-1098 (1), City of Niles, Trumbull Co.;

J. & S. Galier Co., 3418 W. 148 St., Cleveland, O., LB $97,001, est. $110,000. Type structure 0.32 mi. SR 8-2.20, City of Bedford, Cuyahoga Co.;

S. A. Ruebel & Co., 800 Ross Ave., Cincinnati, O., LB $224,355, est. $203,780, T-35 and structure and T-71, 0.557 mi. Longview State Hospital Dr., SR 561-6.81, City of Cincinnati, Parts 1 and 2, Hamilton Co.;

received no bids Oct. L-14, Type T-71 and structure 0.153 mi., CR 82 and 96, S-8 (4), (Village of Valley View), Cuyahoga Co. CD 9/10.

▲ **ILLINOIS**—State Div. Hys., Springfield,

J. C. O'Connor & Sons, Inc., 2104 Miner St., Fort Wayne 6, Ind., LB, $1,735,201, c. conc. base course and c. conc. base course wid'n. 19.67 mi. U. S. 460, White and Jefferson Counties; LB, $1,062,416, c. conc. base course and c. conc. base course wid'n. 25.2 mi. U. S. 460, Jefferson and Hamilton Counties;

Arcole Midwest Corp., 3225 Main St., Evanston, Ill., LB, $1,683,500, c. conc. base course, c. conc. base course wid'n., bit. resurf. 25.5 mi. Ill. 1 and 33 also traffic control signals, Jasper and Crawford Counties;

Arrow Petroleum Co., 7419 Franklin St., Forest Park, Ill., LB, $303,163, bit. resurf. 12.86 mi. U. S. 460 Jefferson Co.;

F. D. Birt Constr. Co., 230 S. Franklin St., Decatur, Ill., LB, $166,429, bit. 7.57 mi. F. A. S. 602 Pike Co;

Coggeshall Constr. Co., Clayton, Ill., LB, $79,261 bit. on grav. or crushed stone surf. 4.12 mi. F. A. S. 590, Adams Co.;

Diamond Constr. Co., 1268½ Jersey St., Quincy, Ill., LB, $109,849, bit. on grav. or crushed stone surf. base, 6.36 mi. F. A. S. 592, Adams Co.

Feigel Constr. Co., 800 E. Michigan St., Evansville, Ill., LB, $522,535, bit. resurf. 20.02 mi. U. S. 460, White and Hamilton Counties;

Gem Contg. Co., Moose Bldg., Quincy, Ill., LB, $60,809 intermittent bit. resurfacing Ill. 9, 94 and 96 Hancock Co.;

M. Hoeffken Co. and Hoeffken Bros., Inc., 22 W. "B" St. Belleville, Ill., LB, $234,004, c. conc. 1.48 mi. Ill. 15, Clinton Co.;

Joyce Bros. Constr. Co., 715 Myers Bldg., Springfield, Ill., LB, $893,347; c. conc. base course, c. conc. base course wid'n. 2 bridges 8.29 mi. U.S. 36, Scott Co.;

McCalman Constr. Co., 619 Section St., Danville, Ill., LB, $558,852, c. conc., 1 culvert 2.47 mi. U.S. 150, Vermilion Co.;

Mason & Meents Constr. Co., P.O. Box 202, Watseka, Ill., LB, $143,158, bit. 8.47 mi. F.A.S. 334, Ford and Iroquois Counties;

W. L. Miller Co., Elwaston, Ill., LB, $63,383, bit. 4.99 mi. F.A.S. 441, McDonough Co.;

Mitchell Constr. Co., 216 E. Madison St., Herrin, Ill., LB, $73,777, c. conc. 0.48 mi. F.A.S. 908, Williamson Co.;

Sankey Bros., Inc., 402 Illinois Bldg., Springfield, Ill., LB, $189,160, bit. resurf. 8.29 mi. U.S. 36, Scott Co;

Standard Paving Co., 30 N. La Salle St., Chicago, 2, Ill., LB, $710,783, c. conc. 3.74 mi. U.S. 40, Clark Co.;

Thompson Asphalt Co., 6 and McCambridge Sts., Madison, Ill., LB, $298,439, bit. 12.5 mi. U.S. 460, Hamilton Co. Bids Oct. 15. CD 10/8.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **W. B. Gibson Co.**, Warren, O., LB, $1,485,795, general constr. plus 3% of the contract for supervision of plumbing, heating, ventilating and electrical work for HOSPITAL addn., WARREN, O., Bd. Trustees, Trumbull Memorial Hospital, Warren, O. Bids Oct. 10. CD 9/17.

▲ **Owens Ames Kimball Co.**, 38 Pearl St. N.W., Grand Rapids, Mich. CA Est. $1,600,000. Wyoming Yards, remodeling 40 stall steam locomotive ROUNDHOUSE incl. service and diesel loco. repair facilities, diesel engine to replace steam, main repair shop addn., repair tracks, install two 420,000 gal. fuel oil tanks, GRAND RAPIDS, MICH. Chesapeake & Ohio R. R. Co., T. F. Burris, ch. engr., General Motors Bldg., Detroit, Mich.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 5 Iowa — November 6 Kansas
November 14 Texas
STREETS AND ROADS
November 5 Iowa — November 6 Kansas, Oklahoma
November 14 Texas

▲† **Okla., Altus**—RUNWAYS, etc.—B.A. 11/13—U. S. Eng., Box 16, Tulsa, Zone 2, runways and taxiways, incl. 11,000 lin. ft. bit. surf. taxiways, 245,000 sq. yd. b. conc. overlay for apron, Inv. ENG 34-066-53-21, Altus Air Force Base. $1,750,000. Bid date changed. CD 10/14.

BIDS ASKED—BUILDINGS

▲† **Neb., Hastings**—STORAGE FACILITIES—B.A. 11/18 P. Wks. Office, Bldg. 1-A, Ninth Naval Dist., Great Lakes, Ill. (a) const. six 1 story, 51x203 ft., rein.-con. inert storage warehouses (b) forty-eight 52x103 ft. earth covered ammo storage magazines (c) nineteen ft. earth covered fuse and detonator storage magazines, rein.-con. (arch type) constr.; (d) four 22x28 ft. earth covered fuse and detonator storage magazines, (e) construct railroads, roads, temporary security fences, fire protection and alarm systems, telephone communications sys., boundary lighting water distr. (fire protection) system, drainage sys. at Naval Ammunition Depot, NOY 74982, Spec. 35909. Plans deposit $100. CD 2/8.

▲ **Tex., Daingerfield**—PLANT—Bids Asked—Longhorn Ordnance Works, Daingerfield, powder propellant plant, $30,000,000. Thiokol Corp., 780 N. Clinton Ave., Trenton, N. J., and R. W. Booker & Assoc., 804 Pine St., St. Louis, Mo., archts.-engrs. CD 1/21/52.

▲ **Tex., Houston**—SHOPPING CENTER—Bids Asked—Brace & Carruth, 705 Garden Oaks St., Unit 1, community or shopping center, $2,500,000; Unit 2, community or shopping center, $3,000,000. P. Herbert Caldwell, 4122 Glenbrook St., archt. R. C. Shaner, 4019 River Dr., engr. CD 10/9.

SOON LETS CONTRACT—BUILDINGS

▲ **Tex., Calallen**—POWER STATION—Central Power & Light Co., 120 N. Chaparral St., Corpus Christi, soon lets contract 66,500 kw electric power station, $5,500,000. Sargent & Lundy, 140 S. Dearborn St., Chicago 3, Ill. engrs. CD 8/22.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **McCarthy Improvement Co.**, 602 Kahl Bldg., Davenport, Ia., LB, $1,588,837, new Lock 19, Mississippi River, Stage 1, Inv. 11-117-53-13, IOWA. U. S. Eng., Clock Tower Bld., Rock Island, Ill. Bids Oct. 15. CD 9/4.

▲ **Massman Constr. Co.**, 20 W. 9 St., Kansas City, Mo. and **Kansas City Bridge Co.**, 928 Broadway, Kansas City, Mo. LB $1,786,250. 4 rein.-con. piers 3 pneumatic, 16,160 cu. yd. concrete. Cole and Callaway Counties MISSOURI. State Hy. Comm., Jefferson City, Mo. Bids Oct. 17. CD 9/30.

▲† **Tecon Corp.**, 1201 Main St., Dallas, Tex. CA $5,947,383, est. $6,659,370. runways, taxiways, aprons, Sedalia Air Force Base, Eng. 23-028-53-17, SEDALIA, MO. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Oct. 14, awarded Oct. 15. CD 9/30.

▲† **Martin K. Eby Constr. Co.**, 610 N. Main St., Wichita, Kan. CA $2,110,527, est. $2,509,699. Group A bldgs., fifteen 2 story dormitories, 3 mess and admin. bldgs., Sedalia Air Force Base, Eng. 23-028-53-9, SEDALIA, MO. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Sept. 30, awarded Oct. 15. CD 10/3, under LB.

▲† **Adler Constr. Co.**, Box 595, Loveland, Colo. CA $3,761,115, est. $5,962,341, constr. Pactola Dam, Rapid Valley Unit, Cheyenne Div., Missouri River Basin Proj., Spec. DC-3783, SOUTH DAKOTA. Bureau Reclamation, Dpt. Interior, Rapid City, S.D. Bids Sept. 30, awarded Oct. 14. CD 10/8, under LB.

▲ **Peter Kiewit Sons Co.**, Omaha Natl. Bank Bldg., Omaha, Neb. and **Condon-Cunningham Co.**, 4229 Lafayette St., Omaha, Neb., CA. Approx. $1,000,000, moving 1,000,000 cu. yd. dirt, surfaced access roads, culverts and seeding for industrial district at 72 and L St. comprises 280 acres. OMAHA, NEB. Bigger Industrial Growth Assn. Electric Bldg., Omaha, Neb.

Gifford-Hill-American, Inc., Myers Rd., Grand Prairie, Tex., CA $908,522, approx. 2,000,000 lin. ft. 2-to 10-in. c.i. water pipe for use balance 1952 and 1953, DALLAS, TEX. City, City Hall, Main and Harwood Sts., Dallas, Tex. CD 5/8.

▲† **Lease & Leighland**, 1501 N. 35 St., Seattle 3, Wash. LB $1,682,678, est. $1,592,241. Dormitories mess, administration bldg. Great Falls Air Force Base, Inv. 53-21, GREAT FALLS, MONT. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids Oct. 16. CD 10/8, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **McGough Bros.**, 1954 University Ave., St. Paul, Minn. CA $1,000,000. PROVINCIAL HOUSE addn., 1890 Randolph Ave., ST. PAUL, MINN. Sisters of St. Joseph of Carondelet, 355 Marshall Ave., St. Paul, Minn. Hills, Gilbertson & Hyes, 1409 Willow St., Minneapolis, Minn., archts.

▲ **Dennehey Constr. Co.**, 513 West Noble St., Oklahoma City 4, Okla., LB $1,151,496, est. $1,000,000. 10 storey HOTEL, LAWTON, OKLA. Lawton Hotel Corp., Lawton, Okla. Bids Sept. 24. CD 9/3.

▲ **Texas State Prison Board**, c/o State Bldg., Austin, Tex. Own Forces. $1,150,000. 600 man individual CELL UNIT at Eastham Farm, near CROCKETT, TEX. CD 7/18/51.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
November 6 Washington
STREETS AND ROADS
November 6 Washington

BIDS ASKED—BUILDINGS

▲ **Calif., Los Angeles**—HEALTH and RECEIVING HOSPITAL—B.A. 11/26—City, City Hall, 9 story, rein.-con. health and receiving hospital $5,000,000. Plans deposit $150. Lunden, Hayward & O'Connor, 510 S. Spring St., archts. CD 3/2/51, under LB.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Russ Mitchell and Bruce Constr. Co.**, 4800 E. 1 St., Fort Worth, Tex., LB. $2,590,405, est. $2,506,266, completing outlet works at Lucky Peak Dam,

Inv. 53-16, IDAHO. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Oct. 16. CD 9/23.

▲ **Young & Smith Constr. Co.**, Beason Bldg., Salt Lake City, Utah, LB $611,101, disposal plant; **Stolte & Sweeney**, Idaho Falls, Idaho, LB $1,060,808. Sewerage sys. extens., MURRAY, UTAH, City, City Hall, Murray, Utah. Bids Oct. 15. CD 9/18.

▲† **Cascade Constructors**, Box 774, Pasco, Wash., LB $3,254,725, Schedule A, power house and fishways machines; LB $272,395, Schedule B, services of crane operator; **University Brick & Tile Co.**, 1213 E. 40th St., Seattle, Wash., LB $200,158, Schedule C, quarry and ceramic tile, McNary Dam, Umatilla Co., Civeng 45-164-53-17, OREGON. U. S. Eng., City-County Airport, Walla Walla, Wash. Bids Oct. 20. CD 10/8.

▲ **Guy F. Atkinson Co.**, 9210 N.E. Halsey St., Portland, Ore., LB. $1,186,794. 41 bridge piers; LB. $1,291,685, superstructures, steel cantilever bridge, THE DALLES, ORE. Wasco Co., Court House, The Dalles, Ore. Bids Oct. 15. CD 9/23.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Utah Constr. Co.**, 57 E. 4th South St., Salt Lake City, Utah, CA Approx. $5,000,000, treble superphosphate PLANT having annual capacity of 75,000 tons, GARFIELD, UTAH. Western Phosphates, Inc., 700 Pacific Natl. Life Insurance Bldg., Salt Lake City, Utah. CD 7/17.

▲ **United Engineers & Constructors, Inc.**, 1401 Arch St., Phila., Pa., CA, Est. $5,000,000. Phenol PLANT on 86-acre site for Monsanto Western & Organic Chemical Div., AVON, CALIF. Monsanto Chemical Co., 1700 S. 2 St., St. Louis 4, Mo.

▲ **Meyer, Nash & Jacobson, Inc.**, 852 Hollywood Way, Burbank, Calif., Owner Builds, $1,600,000, 57 duplex DWELLINGS in Tract 3925, BARSTOW, CALIF. CD 4/18/51.

▲ **Consolidated Builders Incorporated**, 1044 S. Robertson St., Los Angeles, Calif. Owner Builds, $2,292,700, 227 frame, stucco DWELLINGS in Coolgrove Dr., Shadyook Dr., Dos Rios Dr., Allengrove St., DOWENY, CALIF.

▲ **Carson Park Builders**, Box 8086, Long Beach, Calif., CA, $2,593,900, 270 frame, stucco HOUSES in tract 17590, LONG BEACH, CALIF. Carson Park Mutual Homes No. 2, Box 8086, Long Beach, Calif. Paul J. Duncan, 13310 Moorpoark St., Sherman Oaks, Calif., archt.

▲ **M. & K. Corp., Frederickson & Watson Constr. Co.**, Financial Center Bldg., San Francisco, Calif., LB $2,705,000, A. P. Gianinni Junior High SCHOOL at Sunset Community Center, SAN FRANCISCO, CALIF. Dpt. P. Wks., City Hall, San Francisco, Calif. Bids Oct. 15. CD 9/18.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Defence Constr. Ltd.**, 400 Kensington Bldg., Winnipeg, Man., rejected bids Sept. 30, 145 housing units, at R. C. A. F. Station, COLD LAKE, ALTA. Will re-advertise. CD 9/15.

▲ **Bird Constr. Co., Ltd.**, Sargent and Erin Sts., Winnipeg, Man., CA, $3,500,000, est. approx. $1,000,000 flexible cantilever hangar and workshops at air base, WINNIPEG, MAN. Defence Construction Ltd., Kensington Bldg., Winnipeg, Man. Awarded Sept. 30. (Correction—cost). CD 9/4, under CA.

▲ **E. G. M. Cape & Co.**, 620 Cathcart St., Montreal, Que., CA, $3,500,000, cantilever hangar less canopy doors reinforcing and structural steel at air base GREENWOOD, N. S. Defence Constr. Ltd., 1032 Gottingen St., Halifax, N. S. CD 4/4.

▲ **Thunder Bay Harbor Improvement Co.**, 19 Ruttan Block, Fort Williams, Ont., CA $3,000,000, 600 ft. timber foundation piling, sheet steel pile revetments, railway ore dock extension, PORT ARTHUR, ONT. Canadian National Rys. (Western Div.). J. L. Charles, ch. engr., Winnipeg, Man. Bids Sept. 15. CD 9/3.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Canadian Kellogg Co. Ltd.**, 194 Bloor St. W., Toronto, Ont., Ca., $4,000,000, PROCESS UNITS at oil refinery expansion, incl. catalytic cracking unit, polymerization unit, gas concentration unit, CLARKSON, ONT. British-American Oil Co. Ltd., Bay and College Sts., Toronto, Ont. Awarded Oct. 17. CD 11/8/51.

▲ **H. F. Fishleigh**, 372 Bay St., Toronto, Ont., Separate Contracts. $3,500,000, HOUSING DEVELOPMENT north of Eglinton Ave., SCARBOROUGH, ONT. CD 8/27.

▲ **Bradford-Hoshal Ltd.**, 1170 Yonge St., Toronto, Ont., CA, $1,000,000 superstructure 6 story, 45x188 ft., 2 story, 124x140 ft., ADMINISTRATION and OPERATING SECTION, 1½ story, 42x72 ft. BOILER PLANT all steel, brick, TORONTO, ONT. Northwestern General Hospital, c/o John B. Parkin Assocs., archts., 717 Church St., Toronto, Ont. Bids Sept. 16, awarded Oct. 16. CD 9/2.

R. Chalifoux Ltd., 6275 Papineau Ave., Montreal, Que., CA. $996,000, 60-bed, 4 story, bsmnt., 48x190 ft. and 48x60 ft. rein.-con., brick, stone HOSPITAL, LOUISEVILLE, QUE. Hospital Comtois, Inc., c/o Dr. L. Plante, Louiseville, Que. G. Chabot, 236 St. John St., Quebec City, archt.

(Proposal Advertisements see p. 74 to 77)

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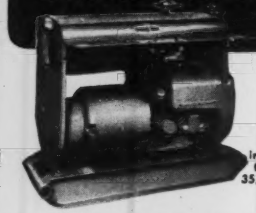

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UNIT PRICES

Municipal sewage disposal project, California

A $1.5 million municipal sewer project in Hayward, Alameda County, California brought spirited bidding from ten contractors competing for four contracts comprising the two sections of the job.

Work consists of installing a sewage treatment and disposal system comprising secondary sewage pumping and disposal works, including comminutors and appurtenances, pumping plant, pumps, control house, vacuator, biofilter and distributor. The contractors are to furnish all material and the work is to be completed in 365 days.

Wage rates are: bricklayers, $3.25 per hr; electrical workers, $2.70 per hr; structural iron workers, $2.70 per hr; sheet metal workers, $2.31 per hr; and laborers, $1.70 per hr. These rates are based on an eight-hour day.

The city engineer is Harry H. Shatto.

Bidders include:

Bids: 7-7-52 Items	Unit	Quantity	Unit Prices 1	2 C
Clawiter interceptor				
1 M & K Corp., Frederickson & Watson, San Francisco, California				$343,845
2C M. Miller & Co., Los Angeles, Calif				471,131
6 Charles J. Dorfman, Los Angeles, Calif				569,845
36" RCP, VCP or asb cmt sewer pipe	lf	10,350	$18.00	$24.78
33" RCP, VCP or asb cmt sewer pipe	lf	2,950	17.00	19.32
5' bk or PC conc MH	ea	40	453.00	500.00
48" reinf conc pipe	lf	3,300	21.00	33.93
27" RCP, VCP or asb cmt sewer pipe	lf	5	18.00	15.00
54", 10 gal, galv corr metal pipe	lf	225	45.00	60.00
Cl C conc	cy	30	23.00	50.00
Cl A reinf conc junct boxes	ea	4	2130.00	2500.00
Calco mod #107, 24" rec flap-gate	ea	1	122.00	120.00
Sluice gates, Armco or equal	ea	2	214.00	250.00
Tennyson interceptor				
1 M & K Corp., Frederickson & Watson, San Francisco, Calif				$266,512
2C A. J. Peters & Sons, San Jose, Calif				339,558
5 McGuire & Hester				639,965
27" RCP, VCP or asb cmt sewer pipe	lf	4,000	$12.00	$23.00
24" RCP, VCP or asb cmt sewer pipe	lf	4,600	12.00	14.70
21" RCP, VCP or asb cmt sewer pipe	lf	5,600	11.00	13.55
18" RCP, VCP or asb cmt sewer pipe	lf	6,400	11.00	11.62
8" Cl 100 CIP with fittings	lf	25	12.00	15.00
42", 10 gal galv corr metal pipe	lf	50	44.00	45.00
36", 10 gal galv corr metal pipe	lf	170	43.00	42.00
4' dia bk or prec conc MH	ea	60	325.00	285.00
Cl A reinf conc junction box	ea	1	1186.00	1500.00
Flap gate, model #102 mounting bracket	ea	1	103.00	125.00
8" gate valve, Rennslr Cl 100	ea	1	240.00	450.00
Cl C conc as spec	cy	10	23.00	30.00
Connec to exist mains thru br MH	ea	3	81.00	150.00
Sewage treatment plant-site improvements				
1C Barrett & Hilp—DeLuca Const. Co., Los Angeles, Calif				$920,471
2 Stolte-Early Const. Co., Oakland, Calif				928,489
6 M & K Corp., Frederickson & Watson, San Francisco, Calif				1,135,580

Items	Unit	Quantity	Unit Prices 1	2 C
Structural exc	cy	10,000	$5.11	$2.50
Rdwy, ditch & misc exc	cy	65,000	0.65	0.35
Import borrow placed & compct	cy	25,000	1.40	1.50
Prep subgrade for pvng	sy	10,000	0.38	0.165
Rdwy, ditch & misc exc	cy	65,000	0.65	0.35
Crusher run base	t	2,750	3.07	3.30
Prime oil & rdwy seal	gal	4,500	0.16	0.14
Plant mix surface	t	1,100	6.74	6.00
Conc curb & gutter	lf	1,000	1.86	2.70
MH, 5', prcst, fr & cover	ea	1	272.00	1580.00
Calco sluice gates	ea	2	410.00	500.00
Std 24" opening catch basin	ea	8	175.00	302.00
48" reinf conc pipe	lf	600	15.06	18.65
Chain-link fence, & gate openings	lf	6,825	2.22	2.48
Compl sprinkler sys	ls	1	14,840	16,200
Interconnec pipework	ls	1	27,737	28,000
12" asb band corr met pipe, Armco	lf	250	3.50	4.00
Devel wtr sup & equip	ls	1	2650.00	1920.00
Water (per 1000 gal)	gal	106	2.65	2.50
Conc, Cl A boxes, headwalls	cy	50	66.00	75.00
Reinf stl	lb	15,000	0.088	0.10
Special MH, 5' prcst	ea	1	1333.00	1660.00
Field off & facil	ls	1	1060.00	2380.00
Reclaimed water pressure system				
1,000 gal, lb 150 per sq in tank	ea	1	1212.00	1125.00
Turb pump units 7½ hp, 220-440 v	ea	2	677.00	880.00
Compr air unit-60 gal 2 hp motor	ea	1	566.00	570.00
4" cl 150 asb cmt pipe	lf	2,000	3.31	3.30
4" gate valves, Rennslr box & covers	ea	5	92.00	60.00
3" hydrant risers, galv iron	ea	12	57.00	120.00
1" galv iron riser, 1" hose cranes	ea	15	32.00	45.00
Pressure control sys	ls	1	2.00	670.00
Cl C conc anchors	cy	25	36.00	640.00
Control house & pumping plant				
Cl A reinf conc pump house & pit	cy	350	70.00	57.00
Reinf stl	lb	97,500	0.088	0.10
Comminutor mach, 1½ hp	ea	2	8,265	9,420
Sluice gates	ea	3	722.00	734.00
Bar screen in comminutor channel	ea	1	238.08	435.00
Pump unit, 695 rpm, 60 hp	ea	1	6,243	7,120
Pump unit, 695 rpm, 7½ hp	ea	1	1,429	1,680
Pump unit, 860 rpm, 15 hp	ea	1	1,488	1,740
Float control switch & riser	ea	1	2.00	960.00
Submersible sump pump, 1/3hp, 115v	ea	1	144.00	265.00
Metal ladders	ls	1	648.00	950.00
Met rlngs, 1½" galv iron pipe	ls	1	1,310	1,040
Yale & Towne trolley ball-bearings chain hoist	ea	2	632.00	585.00
Met grtngs, alum or galv steel	ea	4	112.00	265.00
Hot water radiators, 11-B	ls	1	772.00	555.00
Desk, sltcse, island base	ea	1	216.00	250.00
Desk chair, sltcse, swivel type	ea	1	89.00	95.00
File case, sltcse #1807	ea	1	133.00	145.00
Locker, sltcse, 3-sec stl	ea	1	62.00	65.00
All carpentry & millwrk	ls	1	952.00	660.00
Hot water boiler inc pipe valves	ls	1	1,885	8,250
Chlorine mach, W & T type, A-586	ls	1	10,693	11,340
Furn & install 2nd chlorine machine	ls	1	6,898	7,950
Arch items & finish wrk	ls	1	7,177	10,430
Bronze dedic plaque	ls	1	230.00	160.00
Laboratory equipment	ls	1	1,968	2,120
Telephone facility in location	ea	1	53.00	110.00
Pabco, comp roofing cont	ls	1	308.00	580.00
Flow meter, chronoflo	ea	1	533.00	510.00
Meter charts of type & graduations	ea	500	0.06	0.06
Water heater, Hoyt, 30 gal	ea	1	155.00	155.00
Const plumb fixtures & appurt	ls	1	384.00	240.00
Pipework, water & gas, complete	ls	1	13,560	11,620
500 gal galv iron fresh water bal tank	ls	1	335.00	390.00
Vacuator				
Conc vacuator struct	cy	375	65.00	57.00
Reinf stl	lb	112,500	0.088	0.10
Stan vacuat unit & equip	ea	1	20,837	24,950
Sludge pumping units 5 hp	ea	2	1,262	3,070
Sludge return pump units 3hp	ea	2	1,218	2,900
Kenco submers bronze sump pump, 1/3hp, 115 v	ea	1	144.00	750.00
Sluice gates, models & sizes specified	ea	4	362.00	340.00
All arch items & finish work	ls	1	1,945	2,040
All pipework, interconnect & appurten	ls	1	6,800	880.00
Ventilation sys type B 1/15 hp	ea	1	271.00	200.00

Continued November 14

Commercial building due to pick up

Contractors can expect to handle more commercial building in 1953 than at any time since the fall of 1950 when government controls first started to choke new commercial construction.

Commercial building has renewed the upswing which was temporarily halted by the steel strike.

With the month almost over, October contracts, as reported by ENGINEERING NEWS-RECORD, are expected to hit the highest level for any month since November, 1950, almost two years ago.

So far in 1952, commercial building contracts have reached a total of $556 million, 5% more than in 1951. This is still 32% behind the record year of 1950. But, if the current trend continues, the gap will continue to narrow and next year could see volume back near the 1950 level.

• More work ahead—A bright spot in the picture is the rate at which new work is piling up, at the planning stage.

New commercial projects going into ENR's backlog of proposed construction have had four times the value of work moved out of the backlog into contracts.

In the first nine months of this year, new commercial building projects worth $843 million were proposed. This was a jump of 21% over the amount proposed in the 1951 period.

While the current trend for increased commercial building is widespread, it is not nationwide. Contractors in one section of the country are doing better than those in other parts of the nation.

The Middle Atlantic states have made the biggest comeback in commercial building this year. Led by New York and Pennsylvania, which are holding the No. 1 and No. 2 spots, respectively, the Middle Atlantic states registered $126 million in commercial contracts in the first nine months of the year. This was $1 million more than the total for all of 1951.

The Middle West is also running ahead of 1951, with $119 million for the first nine months. Michigan and Ohio have led the way, with Illinois close behind.

New England showed a slight increase over 1951 as Massachusetts accounted for two-thirds of the $30 million in commercial contracts in this region.

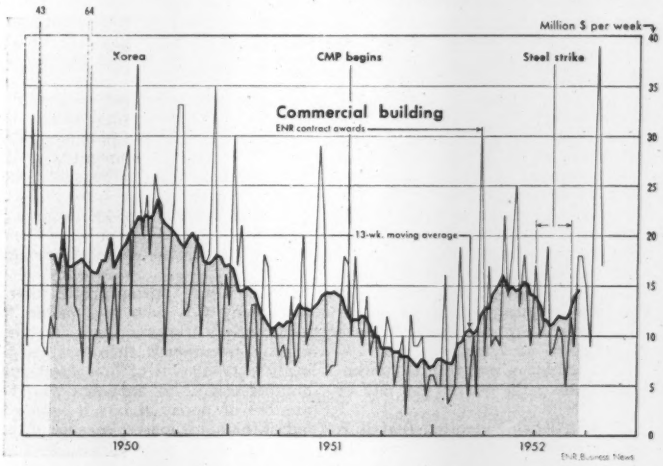
• Some are lagging—Elsewhere in the nation, the picture is not as bright.

Commercial building in the South is running a little under last year. But, on the whole, contract volume has shown little change since 1950.

The most serious drop was in the states west of the Mississippi. In this region, commercial contract volume sagged to only $78 million for the first nine months.

This region dropped to fourth position in 1951; it had led the nation in commercial building in 1951 and was second in 1950. The sharp drop was due mainly to smaller volume in Texas. The Lone Star State set the pace for the U. S. last year. This year, it dropped to fifth place.

The Far West, with $36 million in new contracts, suffered a similar dearth of new commercial projects this year. The key factor was the lower volume in California, which ran seventh in the nation during the first nine months of this year. Last year, it was the fourth highest state in the amount of commercial volume.



Contractor turnover spotlighted by ENR

An analysis of contract awards reported by ENGINEERING NEWS-RECORD during 1950-51 shows a high turnover from year to year among contractors doing heavy construction.

Of the 9,718 contractors listed, 30% were awarded contracts in both 1950 and 1951. The other 70% were about equally divided in getting on the list either in '50 or '51, but not in both years.

Contractors doing heavy construction other-than-building had a lower turnover than building contractors. Of the 5,068 doing highway, bridge, sewerage and other engineered construction, 33% had contracts in both years, while 67% had contracts for either one or the other of the two years.

Building contractors had the highest turnover. Out of a total 4,650 builders, 27% were listed for contracts in both 1950 and 1951. The other 73% appeared on only one list, either for 1950 or 1951.

New faces outnumbered the old among contractors in 1951. ENR reported that 58% of the 2,962 builders listed in 1951 were not listed the previous year.

There was a slightly larger number of new contractors doing heavy construction other-than-building in 1951 than those listed for such work in both 1950 and 1951.

More building contractors were listed last year than in 1950. The number of contractors doing construction other-than-building was slightly lower.

These findings on contractor turnover covered only those contractors with $100,000 or more in contract awards reported for the year by ENGINEERING NEWS-RECORD.

Some contractors might not show up on the 1951 list because of a large carryover of work from the previous year.

Builders hit GI loan snags

Home builders are having trouble getting 4% mortgages for their buyers. That was the situation in 11 out of 14 cities checked this week by ENGINEERING NEWS-RECORD in a "spot-check" study.

In three of the cities, Chicago, Cleveland, Ohio, and Miami, Fla., builders are paying premiums up to $200 and $300 to banks that will give a 4% Veterans Administration-insured mortgage loan.

Milwaukee, Wis., Hartford, Conn., and Boston, Mass., apparently are still good spots in which to get a 4% mortgage loan. But they are the exceptions.

Four percent money is tight, in varying degrees, in Chicago, Cleveland, San Francisco, St. Louis, New Orleans, Austin, Tex., Detroit, Little Rock, Ark., Nashville, Tenn., Atlanta, and Miami.

The tightening of GI loans is not new. It has been known for months that insurance companies, once active in this market, have withdrawn. Banks and building and loan associations have protested with increasing vigor the government's decision to hold VA-insured loans to a 4% interest rate. Many of these have hinted broadly that they are cutting down on the VA loans "to balance their portfolios."

Premiums paid to banks by builders —in some cases out of their own pockets—looks like a new practice. Although reported in only a few cities now, it could easily spread as mortgage money grows tighter, conventional interest rates move up, and 4% loans become less and less desirable to lenders.

• **Discount mortgages**—Chicago is one of the cities where GI loans are hard to place. Little improvement in the tight supply of VA-insured mortgages can be expected in the Windy City until interest rates are increased.

Investment firms are not interested in these VA mortgages, but, in some cases, will underwrite up to 50% of some projects in VA loans.

This situation is working a hardship on the home purchaser, as well as the builder. Since contractors, in many cases, have to discount the mortgage in selling it to investment companies, they must either take the amount of the discount out of their own profit on the home, or pass it along to the purchaser, boosting the selling price.

The situation is similar in Miami. Semi-rural and small town areas are hardest hit by the shortage of 4% money. The sale of homes for GI's is brisk in Miami itself, however.

Robert S. Kistler, head of the local mortgage banker group, explained that mortgages are being sold at a discount with the veterans paying the discount.

Miami lenders generally agreed that some of the mortgages are sold to the Federal National Mortgage Assn., but "as far as private mortgage money is concerned, it just doesn't exist."

One prominent home builder in Cleveland told ENGINEERING NEWS-RECORD that banks are so reluctant to make a 4% loan that, "It is the common practice here for the builder to pay $400 to $600 to the bank in order to make a sale."

The importance to the builder of getting VA financing is demonstrated in the case of a large-scale home builder who recently opened a 300-home project in Parma, a Cleveland suburb.

This builder did not sell a single house in the development at the FHA down payment of $2,950. After some negotiation, he obtained VA financing from New York City firms and within 24 hours he had sold nine of the homes because of the lower down payment.

• **Out of the market**—Other cities throughout the country see discounting at least on a limited basis. Where discount practices are not prevalent, mortgage men were quick to assert that the 4% market "had dried up."

Mortgage bankers, insurance companies, and savings and loan associations in Atlanta, Ga., are virtually out of the VA market because, as Robert Tharpe, president of the Atlanta Mortgage Bankers Assn., said, "We just can't do business on a 4% basis."

In Nashville, Tenn., a life insurance company official said his company quit buying VA mortgages, on any scale, 18 months ago.

"Since March, 1951, interest rates on other types of securities have shown increases of .5% or more, but there has been no change in the 4% VA rate—and that's why VA mortgages aren't attracting lenders," the life insurance official said.

He added that the few GI loans being purchased by his company at this time are going at a 3% discount.

In Little Rock, Ark., veterans have almost given up hope of getting 4% VA-insured loans, now turn to conventional loans with an interest rate of about 5%.

Detroit, Mich., reported that it is almost impossible for a veteran to get an individual GI loan to finance a home.

However, a veteran can still get a GI mortgage by buying a home in a large project where the builder unloads the mortgages to financing groups and insurance companies at a discount of $300 to $500 per $10,000. The builder absorbs the loss on the mortgage.

VA home loans are "practically unobtainable" in the Austin, Tex., area, an official of one of the largest home mortgage firms said.

This man said the only way a veteran can get the 4% VA loan is to pay, unknowingly, a fee in the guise of a sales commission to the builder. This fee generally runs to 5% markup on the home.

Other mortgage men in the city said they have withdrawn from the VA loan market rather than "risk any blow-up."

New Orleans veterans can't get a 4% loan on an individual home, but can get VA mortgages if they buy a home in a large development.

GI loans are discounted as much as 4% in St. Louis, Mo. Even on this basis, such mortgages are not so easy to obtain as in Atlanta, where discount practices are not common. San Francisco bankers have simply reported that the supply of 4% money has disappeared.

It is almost impossible to get a VA loan in San Francisco except in cases where builders have had prior commitments from lenders.

• **Three "good spots"**—Some ray of hope continued to break through the dark clouds in three cities—Boston, Hartford, and Milwaukee.

In general, banks in the Boston area are still willing to take GI mortgages without a discount. Some lenders have reached their capacity but the majority are still active.

Hartford reported that in the city itself and in nearby communities GI's are not having trouble obtaining VA loans. The general comment was, "If they are financially responsible, the money is there."

And, in Milwaukee, 4% loans are available. In fact, the number of loans granted has increased month by month since July.

While it was apparent in the survey that many GIs who are unable to secure 4% VA-insured loans are turning to conventionals, there was no immediate tabulation of how great this number was. Also unknown was the number of potential buyers who are out of the home market because of the tightened money supply.

Consultants sign up $5.2 billion in year

A new study shows that 1,302 consulting engineers in 1951 took on 4,332 new jobs that they estimated would cost $5.2 billion.

Dollar-wise, $2.76 billion of this new business came from big building projects and $2.44 billion from other heavy construction.

Industrial building accounted for most of the new business with $1.45 billion. Commercial, public building and mass housing took second place with $1.3 billion.

Other major sources of new business included airports with $681 million; unclassified projects with $516 million, much of which was for pipelines and transmission lines; and sewerage with $356 million.

Facts for this study, the first of its kind, came from proposed construction projects reported in 1951 by the CONSTRUCTION DAILY.

The 1,302 consultants studied each took on new projects valued at $100,000 or more for the year. They signed up 4,332 projects of which 1,344 were buildings, and 2,988 were other classes of heavy construction. Sewerage projects outnumbered all other types of construction.

The table shows the number of consulting engineer firms or individuals active in each major class of construction.

The largest number, 524, were active in commercial, public building, and mass housing, while 383 signed up industrial buildings.

The number of consultants taking on jobs in other classes of heavy construction was greatest in the sewerage field with 388, and in waterworks, with 329.

Not included in this study are engineering constructors where the same company handles both design and construction. Architect-engineers are included.

Businessmen urge end of construction curbs

At its Washington meeting last week, the Construction and Civic Development Department Committee of the U. S. Chamber of Commerce backed up industry's demand for prompt relaxation and early removal of construction controls.

In a unanimous resolution, the committee came out for: (1) immediate relaxing of construction controls for the remainder of 1953, and (2) the suspending of all such controls on January 1, 1953, with necessary protection of direct defense needs.

The committee gave two reasons for its action:

- It said quick decontrol is necessary if the government is to "retain public confidence in controls as an instrument to be used only when needed for national defense."
- The committee said prompt action is a must if the nation's largest industry is to maintain a reasonable level of employment.

Loosening of steel supplies (ENR Oct. 23, p. 21) was a major factor in the committee's decision. To plan and schedule projects for next year, owners and investors must have a realistic statement from mobilization agencies now on what the government will do about controls in the next few months, committee members emphasized.

Consulting engineer new business in 1951
as reported by Engineering News-Record and Construction Daily

Based on consulting engineers with $100,000 or more new business in 1951

Type of work	Total number of engineers	Total number of projects	Total construction volume (millions)
Heavy, other than building	....	2,988	$2,437.2
Waterworks	329	759	298.9
Sewerage	388	946	356.1
Bridges	56	103	235.6
Streets and roads	195	334	105.9
Earthwork, irri., drain	73	89	243.8
Airports	153	354	681.0
Unclassifed	226	402	515.9
Building	....	1,344	2,763.1
Industrial	383	552	1,453.3
Mass housing, commercial and public	525	792	1,309.9
All types of construction	1,302	4,332	5,200.3

DPA grants tax aid to 101 new projects

Certificates of Necessity for fast tax amortization for 101 new or expanded facilities, with a value of $133.1 million, were issued by the Defense Production Administration from Oct. 2 through Oct. 8, the agency announced last week.

Largest certificates issued in the latest group were: Carolina Power & Light Co., Wilmington, N. C., electric power, $17.4 million; Gulf Oil Corp., motor gasoline, $12 million; and Delaware Power & Light Co., Edge Moor, Del., electric power, $11.9 million.

Fast tax amortization amounting to $22.9 billion has been granted for 14,099 projects since the start of the program.

Toll bridge planned near McNary Dam

Umatilla, Ore., County Court has applied to Walla Walla, Wash., District Office, Corps of Engineers, for a permit to build a $4-million toll bridge across the Columbia River three miles below the site of McNary hydro-power dam.

County Judge James Sturgis said the structure would include two 600-ft spans. This replaces an original proposal for the county to build a bridge across the top of the McNary Dam, a plan which was abandoned when military authorities indicated opposition for security reasons.

Sturgis said Tudor Engineering Co., San Francisco, and Coverdale and Colpitts, New York City, have agreed to handle sale of revenue bonds for the toll bridge. The firms hold a similar agreement with Wasco County for a toll bridge spanning the Columbia below The Dalles Dam project.

State action urged on New Jersey water

New Jersey's section of the American Water Works Assn. last week urged early state action on water shortage problems rather than reliance on the four-state Incodel Plan for development of the Delaware River.

Citing the "uncertainty of obtaining within the near future" water from the Delaware, the group's water supply committee stressed the urgency of needs in southern as well as northern New Jersey.

Change in present state laws was urged to permit commissions in each area to issue bonds for financing.

Airport aid boost requested

Federal aid to civil airports will go up in the next fiscal year if the Commerce Department and its Civil Aeronautics Administration are able to sell Congress on a program announced this week.

Airport aid has suffered severely since Korea. Last year the Budget Bureau imposed a $15-million freeze on CAA grants to civil airports, shutting off a big part of the annual money voted for the purpose. For the current fiscal year, Congress appropriated only $11 million.

An effort will be made to recover some of the lost ground, under the program proposed this week by Commerce Secretary Sawyer. The next Congress undoubtedly will be asked to vote more than $40 million for fiscal 1954.

Money was appropriated at about a $40-million annual rate during the first four years of airport aid, 1947 to 1950. Today, CAA could prudently dispense much more than that amount. A large part of the increased funds would be used to start new airports.

• **Would look ahead**—Sawyer has asked CAA to review the whole airport aid program as a basis for requesting and using additional funds to speed up the nation's airport program. Not only do we need money now to start new airfields and to hasten completion of airports and improvements already under construction, Sawyer said, but we must also be looking ahead to the possible use of jet aircraft for air transport in this country. That change would bring on a whole new set of problems, not only in runways and terminal facilities but also in weather and communication services for 500-mph flight, he pointed out.

In its original broad concept, the federal aid airport program of 1946 authorized CAA expenditures of $520 million in seven years. Under this 1946 law, the CAA matches funds put up by local government bodies for airport construction.

Actual appropriations during the seven years have totaled $195 million. CAA has obligated all of that money except $13 million, and the $13 million is under tentative allocation to airport projects. Up to the end of September, more than 2,300 projects had been completed in nearly 1,200 locations.

A survey that month showed $157 million in federal funds needed to match local funds for airport developments that are justified by both civil and national defense requirements. About $75 million of the local matching funds had already been raised, and the remaining $80-odd million would be raised very quickly once federal funds become available, CAA found.

Congress won't be easy to convince. With defense spending at a high level, the CAA will have to show real need and great value in its proposals before economy-minded congressmen will loosen the purse strings for civil airports. CAA counts on the mounting pressure of air transport to persuade reluctant members that the country can no longer delay the building of adequtae airports.

Airport probers hear 'poor design' charged

A Philadelphia councilmanic investigation committee has been told that the city's new $15-million airport terminal building (ENR June 26, p. 83) is so poorly designed it will increase operating costs of the airlines and fail to produce maximum revenue for the city.

The committee, which is probing both construction and operating costs, expressed astonishment at the charges because the terminal building is still under construction.

Albert E. Blomquist, who qualified himself as a transportation expert, made the "poor engineering" charge as a witness before the committee. He was asked if the design could be changed to get a maximum return from the building.

"There isn't any way to do it," he replied. "You'll just have to make the best of it."

Blomquist said the building, which will not be completed until 1954, was more than double the required size "from any reasonable expectation of traffic."

He added that if the size had been planned "in real relationship to the passenger traffic," the building could have been built for less than the $9 million the council made available in 1946, "including the terminal and field facilities."

Blomquist said the terminal could have been built for $5 million instead of $15 million.

• **Criticizes overall plan**—Blomquist said the building is so constructed that it "defies expansion" from the standpoint of traffic; secondary concession areas were placed in the best positions to catch the flow of traffic; internal walls were all-masonry so that it will be difficult and expensive to make the changes that are often necessary in an airport terminal; that the two fingers are not designed for concessions; and that under these fingers are basements instead of the small channels needed to carry pipes.

The engineers, Airways Engineering Corp., who were relieved of further work on the project two weeks ago, computed the size on a comparison with the National Airport at Washington, D. C., and on a comparison of populations, Blomquist said.

This ignored the fact that Washington's air traffic (2,500,000 passengers a year) is five times that of Philadelphia, Blomquist said.

• **Bid change scored**—Water Commissioner Samuel S. Baxter was also criticized by the council committee. Baxter testified that he permitted Ross Electric Co. to withdraw a bid that was $146,000 less than the second low. The bid was withdrawn on the basis that an error had been made in computation.

The bid was withdrawn the day after bids were opened. When bids were called again, the other firms did not compete and Ross received the contract for $946,000, representing his original bid of $810,000, plus the $79,500 error, plus some added requirements.

The probe is continuing.

Steel 'windfall' assures start on 4 bridges

A windfall of 450 tons of structural steel will make possible the start of construction of four bridges in Arizona, R. C. Perkins, state engineer, reports.

The state obtained the steel from a railroad structure built in 1951 near Richmond, Va., and no longer used. Arizona acquired the 450 tons on a bid of $56,250.

Perkins said 155 tons will be earmarked for building Burro Creek Bridge on the new Wickenburg-Kingman cutoff highway. The bridge will be 450 ft long and 35 ft high. Bids are planned by Jan. 15.

Some 75 tons will be allocated for the Fairbanks Bridge over the Santa Cruz River in southern Arizona. Another 75 tons set aside for the Arivaipa Creek Bridge between Oracle and Winkleman, and 45 tons for the Dripping Springs Bridge near Christmas in northern Arizona. The remaining 100 tons will be held for emergencies.

Asbestos-cement products go up

Contractors face higher prices for a group of asbestos-cement products, but they will pay less for zinc.

Major asbestos-cement products are going to cost more because the Office of Price Stabilization approved a 5.5% increase to manufacturers.

Wholesalers and retailers would be permitted to pass the increase along to the consumer.

Products affected included asbestos-cement siding and clapboards, roofing shingles, flat sheets, corrugated sheets and asbestos cement "accessories" used in connection with these items.

OPS said the industry's earnings had declined because of higher prices paid for imported asbestos fiber, increased freight rates, and higher labor costs.

Meanwhile, the price of zinc was cut again. This time, the price dropped a full cent, to 12¼ cents a pound. Late in September, the price declined ½-cent a pound.

• **Production and shipments**—Materials production and shipments showed some ups and downs, and at least one record.

U. S. production of primary aluminum set a new postwar record during the month of August. The output of 170,350,658 pounds for that month represented a gain of 12.5% over the previous month, and an increase of 15.5% over August, 1951.

Finished portland cement production in August totaled 23,573,000 barrels. This was 5% ahead of the August, 1951, figure, according to the Bureau of Mines.

Mill shipments of finished portland cement totaled 25,915,000 barrels—a decrease of 9.3% from August, 1951. But stocks of 12,816,000 barrels were 12% greater than those of one year ago.

Softwood plywood production for August amounted to 279,531,000 sq ft, about 2% less than the output for August, 1951, according to the Census Bureau.

Shipments and consumption amounted to 272,193,000 sq ft. August month-end stocks were tallied at 101,237,000 sq ft, 9.2% above July.

• **Asphalt products up**—August shipments of all major types of asphalt and tar roofing and siding products, with the exception of insulated brick siding, showed moderate increases over July.

Shipments of asphalt roofing and saturated felts were 9% higher than the preceding month, reaching a peak for the year. Asphalt sidings gained 11%. Shipments of insulated brick siding decreased 5% from July, but were 10% above August, 1951.

In the clay products field, production of brick was steady, structural tile was down and clay sewer pipe was up.

Output of unglazed brick in August totaled 532,000,000 units, virtually the same as July production, but 14% under August, 1951, the Census Bureau reported.

Production of unglazed structural tile totaled 85,000 tons, down 7% from July. Shipments of 88,000 tons, however, showed a slight gain over the previous month.

Clay sewer pipe output totaled 137,000 tons in August, a gain of 3% over July. Shipments of 147,000 tons were also 3% above July.

$95-million bridge assured of financing

A start, next spring, on a $95-million bridge across the Straits of Mackinac was predicted last week by the Mackinac Bridge Authority.

B. J. Van Ingen & Co., New York City investment firm, agreed to underwrite the revenue bonds for the bridge which would have a suspension span 3,800 ft long—second in length only to the 4,200 ft Golden Gate Bridge across San Francisco Bay. (The span of the George Washington Bridge, New York City-New Jersey is 3,500 ft.)

Barring "unforeseen circumstances," engineers should start work on final designs for the bridge this winter, according to Prentiss M. Brown, chairman of the bridge authority.

School construction gets legal approval

The Colorado Supreme Court has upheld the constitutionality of the state's School District Reorganization Act. This clears the way for a large volume of school buildings.

The court decision makes possible the sale of millions of dollars of school construction bond issues of reorganized districts. These bond sales had been held up pending the court's action.

A district reorganization in Adams County was used as the basis of the test case. The district will now be able to proceed with a $936,000 bond program for the construction of more schools.

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Campaign Headquarters U.S.A.

Junior is putting on his GI uniform for the veterans' parade to remind everyone to register so they can vote Nov. 4.
Sis is boning up to write her entry in the Citizenship Essay Contest the businessmen's association is sponsoring at school.
Dad's easy chair is empty —he's at the meeting of the citizens' get-out-the-vote committee.
Mother's helping her club make a telephone campaign telling everyone when and where to register.
Grandma's sending registration reminders to all the church members. Even little Sis is helping—rubber-stamping messages on the cards.

The Family Vote will elect the Next President

NOT THE FARM VOTE...
THE BIG-CITY VOTE...
THE LABOR VOTE...
OR ANY PARTY VOTE...

Politicians talk a lot about this and that "bloc" of voters being decisive factors in this election. So do all the pollsters. You can't blame them for trying to dope it out that way in advance . . . but . . .

YOU know you're going to vote your own sweet way when you get behind that voting booth curtain—that where you live or work hasn't got a blankety-bloc thing to do with how you'll vote. You'll vote for what you believe to be in the best interests of your family—your kids—and your kids' kids.

So YOU know that this year—as always—it will be the FAMILY vote that really decides things. And families are working as never before to make sure every American votes. Right now in millions of American families, everyone from Little Sis to Grandma is pitching in to remind every eligible American to register to make sure of the opportunity to vote. And then they'll tackle the job of getting out the vote of every member of America's 44,000,000 families. They're the biggest "bloc" in America—they ARE America!

If your family is already working at the job—congratulations! If you aren't, talk it over at supper tonight, and pitch in tomorrow.

$170-million road budget sets new California high

The California Highway Commission last week adopted a record-smashing state highway budget totaling $170 million for the fiscal year July 1, 1953, to June 30, 1954.

The budget allocates $76 million to major construction projects (exclusive of right-of-way). This compares with $72 million allowed for major construction in the 1952-1953 budget which reached a total of $156 million.

Of the construction monies, $36 million will be spent in the state's 45 northern counties and $38 million in the southern 13.

Other items included in the budget are:

Rights-of-way—$34 million, maintenance—$24 million, preliminary engineering—$10 million, construction engineering—$8 million, administration—$5 million, buildings and plants—$3.5 million, highway planning—$1.75 million, maintenance and insurance of the San Francisco-Oakland Bay Bridge—$1.2 million, minor improvement and betterment—$1 million and a contingency reserve of $5.5 million.

Also approved were other non-state highway functions under supervision of the commission—$23.2 million from the gas tax fund for major city streets administered by the cities, $5.8 million for federal aid secondary roads, the majority of which is apportioned to county roads, and $70,000 for administration work on outdoor advertising.

$5-million bond issue awarded to Chicago group

A syndicate headed by the First National Bank of Chicago has been awarded sale of $5 million in Rhode Island state highway bonds, first of $12 million authorized by voters in 1950 to finance a seven-year building program.

The Chicago group was highest of 10 financial firms or associations bidding for the issue, offering a premium of $9,882 for the bonds at 2%. The Chase National Bank of New York offered the same interest but a premium of $8,795.

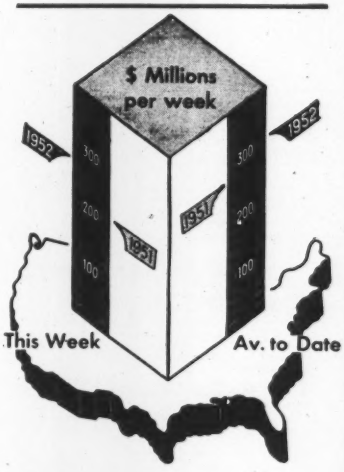
Other lower bids not only offered a lower premium but demanded a 2¼% rate.

Proceeds of the bond issue will be used in conjunction with annual state highway appropriations and federal matching grants. Until now the state has been able to finance the seven-year program by money from regular appropriations.

Anticipating heavy expenditures early next year for such projects as the Providence Throughway, a new high-level bridge over the Sakonnet River at Tiverton, and completion of the Worcester-Providence Throughway, the state now is issuing bonds.

Activity This Week

As reported to ENR (in millions of dollars)



Contracts by type of work

	This Week	Cumulative 44 wks. 1952	1951	% chge
Waterworks	$3.9	$188.9	$178.5	+6
Sewerage	8.6	251.4	274.0	−8
Bridges	4.9	345.2	278.4	+24
Highways	29.2	1,279.3	1,019.6	+25
Earthwork, waterways	7.2	424.0	440.8	−4
Buildings:				
Public	64.4	4,037.1	1,881.6	+115
Housg., pub.	3.8	552.8	578.1	−4
Housg., priv.	55.7	2,536.5	1,676.3	+51
Commercial	8.5	564.9	541.9	+4
Industrial	57.6	2,368.0	3,634.6	−35
Unclassified	33.0	1,154.2	1,457.3	−21
Total	**$276.8**	**$13,702.3**	**$11,961.1**	**+15**

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

ENR indexes	Base Year = 100 1913	1926	1949
Constr. cost. Oct.	588.43	282.86	123.27
Sept.	586.8	281.73	122.86
Bldg. Cost. Oct.	424.77	229.62	120.70
Sept.	424.40	229.42	120.64
Volume Sept.	441	179	127

OFFICIAL PROPOSALS

Bids: November 12, 1952

Home Office Building— State Insurance Fund

199 CHURCH STREET, NEW YORK CITY

NOTICE TO BIDDERS

Separate sealed proposals covering (1) the demolition of the existing buildings and removal of all debris, (2) the construction of the foundations, (3) the furnishing and erecting of the structural steel, as shown on the plans, specifications and drawings and in accordance with the general conditions covering the erection of a home office building for the State Insurance Fund at 199 Church Street, New York City, New York will be received by William B. Folger, Executive Director of the State Insurance Fund at his office, Room 822, 625 Madison Avenue, New York City, New York until 2:00 o'clock p.m. Eastern Standard Time on November 12, 1952 when they will be publicly opened and read.

Each proposal must be made upon the form provided therefor and shall be accompanied by a certified or cashier's check made payable to the State Insurance Fund in the sum of $2,500.00 for the proposal covering the demolition of the existing buildings and removal of debris, $15,000.00 for the proposal covering the construction of the foundation, and $25,000.00 for the proposal covering the furnishing and erection of the structural steel, as a guaranty that the bidder will enter into the contract if it be awarded to him. The blank spaces in the proposal must be filled in and no change shall be made in the phraseology of the proposal. Proposals that carry any omissions, erasures, alterations or additions may be rejected as informal. Successful bidder will be required to give a bond conditioned for the faithful performance of the contract and a separate bond for the payment of laborers and materialmen, each bond in the sum of 100% of the amount of the contract. Corporations submitting proposals shall be authorized to do business in the State of New York. Drawings, specifications, general conditions and form of proposal, contract and bonds may be examined free of charge at the following offices during regular business hours:

The State Insurance Fund
Room 822
625 Madison Avenue
New York, New York
Lorimer Rich Associates, Architects
215 Montague Street
Brooklyn, New York

Drawings, specifications, general conditions and forms of proposed contract and bonds may be obtained by calling at the office of Lorimer Rich Associates, Architects, 215 Montague Street, Brooklyn, New York during regular business hours and making a deposit of $10.00 for each set covering the foundation and demolition work and $25.00 for each set covering steel work, or by mailing such deposit to said architects at said office; additional sets may be obtained at reproduction cost. Checks shall be made payable to Lorimer Rich Associates, Architects. Deposit shall be returned upon return of drawings and specifications in good condition within thirty days after opening of bids, to such persons as shall have submitted bids. Reproduction costs paid for additional sets are not refundable. The State Insurance Fund reserves the right to reject any or all bids.

THE STATE INSURANCE FUND
By WILLIAM B. FOLGER
Executive Director

Dated: New York, October 27, 1952

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-3829) will be received at Denver, Colorado, until December 2, 1952, for furnishing two vertical-shaft centrifugal or mixed-flow pumps, each with a capacity of 217 c.f.s. under a head of 32.5 feet; two vertical-shaft, centrifugal pumps, each with a capacity of 240 c.f.s. under a head of 87 feet; and one vertical-shaft centrifugal or mixed-flow pump, with a capacity of 225 c.f.s. under a head of 57 feet, for Wellton-Mohawk Division, Gila Project, Arizona. Delivery is desired within 540 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver, Colorado.

OFFICIAL PROPOSALS

RATE: THE RATE FOR OFFICIAL PROPOSAL ADVERTISING IS $1.50 PER LINE (OR FRACTION) PER INSERTION.

CLOSING DATE: FRIDAY 10:30 A. M. FOR THE ISSUE DATED THE FOLLOWING THURSDAY.

SEND COPY TO: OFFICIAL PROPOSAL DIVISION, ENGINEERING NEWS-RECORD, 330 W. 42ND ST., NEW YORK 36, N. Y.

Bids: November 13, 1952

Canal Improvement State of New Jersey Department of Conservation and Economic Development, Division of Water Policy and Supply

NOTICE FOR BIDDERS

Sealed proposals for the construction of the "Ten-Mile Lock Control Structures" on the Delaware and Raritan Canal in Franklin Township, Somerset County, New Jersey, will be received by the Division of Water Policy and Supply at its office, Room 307, 520 East State Street, Trenton, N. J., until 2:00 PM (E.S.T.) Thursday, November 13, 1952, at which time and place the bids will be publicly opened and read.

The work includes the removal of the existing timber headwall, original gate structure, operating machinery, timber wing walls, temporary wooden foot bridge, and existing timber waste gates and operating stands; constructing a new reinforced concrete gate structure, constructing steel sheet piling wing walls; constructing new concrete waste gate headwall; installing gates; repair of masonry in lock chamber; miscellaneous work; and restoring the site. Principal items of construction and approximate quantities involved are: Cofferdams and pumping; removal of existing structures; foundation excavation 50 cu. yds.; rock excavation 15 cu. yds.; concrete Class D 125 cu. yds.; concrete Class B 125 cu. yds.; reinforcing steel 4000 lbs.; steel sheet piling 2600 sq. ft.; installation of five sluice gates; repair of masonry in lock chamber, pneumatic mortar protection 9500 sq. ft.

Drawings, specifications, form of bid, contract and bond for the proposed work will be on file at the Canal Office of the Division, 342 Academy Street, Trenton, N. J., and may be inspected by prospective bidders during regular office hours. Plans will be furnished on the deposit of $1.00 for each set on application to the Canal Office.

Bids must be made on standard proposal forms and must be submitted in sealed envelope bearing the name and address of the bidder on the outside, marked "Proposal for Ten-Mile Lock Control Structures", and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey in the amount of ten per cent of the bid submitted, and must be delivered at the above place on or before the time stated. Copies of standard proposal forms will be furnished on application. Prequalification of bidders will be required. The right is reserved to reject any or all bids.

BY ORDER OF THE WATER POLICY AND SUPPLY COUNCIL, John Wyack, Secretary.

Bids: November 13, 1952

Four Wheel Drive Dump Trucks With Snow Plows

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AND
LA GUARDIA AIRPORTS
PROPOSAL NO. 951A-951B

Sealed proposals for furnishing four (4) four wheel drive dump trucks with snow plows for delivery to New York International and La Guardia Airports will be received at the office of the Director of Purchase of The Port of New York Authority, Room 1402, 111 8th Ave., New York 11, until 11:00 A.M., Thursday, November 13, 1952, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained upon request at the office of the Director of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, October 22, 1952

Bids: November 6, 1952

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 6th day of November 1952, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2 — LACY KETCHUM, District Engineer, 109 No. Genesee St., Utica, New York						
Montgomery	M.T. 52-13 RC(MT) 52-107	New York State Thruway Mohawk Section-Sub 14 (Randall-Fort Hunter) Relocated Canajoharie-Fultonville, Pt. 2 S. H. 8371	0.98	Asp. Conc. Ty. 1A, Opt. Twin Box Br. 2 @ 22.5′ Twin Box Br. 2 @ 22.75′ R. R. Sep. 3 Sp. Alpha I-Beam 300′	$41,000 Plans $15	$761,000
Mont. & Herkimer	M.T. 52-16 S.T. 52-28	New York State Thruway Mohawk Section-Sub. 12BE & 12BW (Indian Castle-Caroga Creek (Co. Rd. 65; Indian Castle Rd.; Farm Rd.; Co. Rd. 188 & Town Rd.	8.71 Thwy. 3.30 Acc.	9″ Cem. Conc. Pavt. 2 @ 25′ = 5.71 Mi. Asp. Conc. Ty. 1A, Opt.= 2.77 Mi. Cal. Chloride Treated Gravel = 0.53 Mi. Hy. Sep. Conc. Rigid Frame 31′ Br. & Hy. Sep. 3 Sp. Alpha I-Beam 179.6′ Hy. Sep. 4 Sp. Alpha I-Beam 266.8′ Hy. Sep. AlphaI-Beam(& Culv.) 48.1′	$306,000 Plans $100	5,562,000
DISTRICT No. 7 — C. C. CASSEL, District Engineer, 444 Van Duzee St., Watertown, New York						
Clinton	FARC52-110	Ausable Forks-Clintonville S. H. 476 Clintonville-Keeseville S H. 651 Proj. F-876(2)	8.97	Asp. Conc. Ty. 1A, Opt.	$69,000 Plans $25	1,275,000
Franklin	FASH 52-17 FARC 52-109	Works Corners-Colbys Corners Paul Smiths-Gabriels. S. H. 9027 Proj. F-562(6); F-644(2)	5.80	Asp. Conc. Ty. 1A. Opt.= 5.76 Mi. Misc. Work = 0.04 Mi.	$39,000 Plans $25	709,000
DISTRICT No. 10 — J. J. DARCY, District Engineer, Montauk Highway, Babylon, L. I., New York						
Bronx	FACBE 52-2	Cross Bronx Expressway Contract 9Y Proj UI-1084(17)	0.19	Demolition of Bldgs.	$5,000 Plans $10	95,000
Bronx	FAMDE52-5	Major Deegan Expressway Contract 6 Proj. U-1082(12)	1.29 Exp. 0.28 Acc.	Grading Drainage & Misc. Work = 1.29 Mi. Sheet Asp. Pavt.= 0.12 Mi. Cem. Conc. Pavt.= 0.16 Mi. Hy. Sep. Alpha I-Beam 119.69′ Hy. Sep. Alpha I-Beam 98.55′	$415,000 Plans $100	7,520,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders." When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

Bids: November 12, 1952

Hoboken-Port Authority Piers

THE PORT OF NEW YORK AUTHORITY
BORINGS
CONTRACT HP-110.002

Sealed proposals for making channel borings in an area between Pier No. 2 and Pier No. 6 at Hoboken, New Jersey, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 2:30 P.M., Wednesday, November 12, 1952, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Engineer of Materials, Room 1110, and copies will be furnished upon deposit of $10 per set. Deposit to be delivered to the Treasury Department, Room 1001, where a receipt in duplicate will be issued. A copy of the receipt should then be delivered to the Engineer of Materials who will furnish the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, October 30, 1952

OFFICIAL PROPOSALS

Bids: November 12, 1952

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

NICHOLSON ROAD

Construction of Nicholson Road from Black Horse Pike to Wyoming Avenue, Borough of Audubon, Camden County, Federal Aid Secondary Project No. S-23(4). Length 0.748 miles.

Estimated:

4,029 cu. yds. Excavation—Unclassified
1,598 cu. yds. Subbase
9,584 sq. yds. 9" Plain Concrete Pavement
1,523 lin. ft. Drainage

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Wednesday, November 12, 1952, at eleven o'clock (11:00 A.M. EASTERN STANDARD TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements, and by P. L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 910 Broadway, Camden, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

CONTRACTORS WATCH THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

OFFICIAL PROPOSALS

Bids: November 19, 1952

Booster Pumping Stations and Underground Reservoirs Department of Water Supply City of Detroit, Michigan

CONTRACT NO. BP-1

Sealed proposals for constructing Booster Pumping Stations and Underground Reservoirs will be received by the Board of Water Commissions of the City of Detroit. Proposals shall be addressed to the Board of Water Commissioners, City of Detroit, Room 506, Water Board Building, 735 Randolph Street, Detroit 26, Michigan and shall be endorsed "Proposal for Contract No. BP-1". Proposals will be received until 10:00 A.M. Eastern Standard Time, November 19, 1952, at which time they will be opened and read aloud in the Board Room, Fifth Floor, Water Board Building, 735 Randolph Street, Detroit 26, Michigan. Any proposal received after the time referred to above will be returned to the bidder unopened.

The work to be performed includes the construction of a waterworks booster pumping station and underground reservoir and installation of certain items of major equipment furnished by others at each of the following locations:

(a) Northwest Booster Plant on James Couzens Highway at the corner of Greenfield Road. Pumping Station housing five vertical centrifugal waterworks pumping units, each having a capacity of 10 MGD; underground reinforced concrete storage reservoir of 10 million gallons capacity; piping connections between distribution system, reservoir and pumping station, and other related work.

(b) East Side Booster Plant at the corner of Warren and Canyon Avenue. Pumping station, reservoir, piping and other work similar to that at Northwest Booster Plant above, but with only three pumping units installed in the pumping station.

The power transformers, electric switchgear, pumping units and cone valves required for each of the above stations will be furnished under other contracts and delivered to the site for installation under this contract.

The approximate quantities of a few of the major items at each station are listed below to give bidders a general idea of the magnitude of the work and are not intended to be close estimates of the quantities involved.

	For Each Station
Earthwork (minimum)	85,000 cu. yds.
Reinforced Concrete	12,000 cu. yds.
Brick and Tile Masonry	140 M
Structural Steel and Miscellaneous Metal	40 Tons

Separate proposals on the lump sum price basis for the complete work at either or both of the two stations are solicited.

It is required that the work be completed at each station ready to pump water within 180 calendar days after the notice to commence work.

The contract documents may be examined during business hours, at the office of the Department of Water Supply, Room 706, Water Board Building, 735 Randolph Street, Detroit, Michigan. The contract documents may be obtained at the above office by making a deposit of $25.00 per set, which sum will be refunded upon the return of the complete Contract Documents in good condition within thirty (30) days after the bid date, or if used in making a bona fide proposal.

Each proposal shall be accompanied by a certified check or a satisfactory bidder's bond in an amount not less than five per cent (5%) of the total lump sum price bid, drawn payable to the City of Detroit, Board of Water Commissioners, as security for the acceptance of the Contract.

No proposal may be withdrawn for at least sixty (60) days after the scheduled closing time for receipt of bids.

The Board of Water Commissioners reserves the right to waive any informality in any bid and to accept any bid, or to reject any or all bids, should it deem it to be in the best interests of the City of Detroit so to do.

CITY OF DETROIT
BOARD OF WATER COMMISSIONERS
Oscar Wagner, President
George A. Shaffer, Vice President
Alfred J. Simpson

L. G. Lenhardt, Superintendent
General Manager and Chief Engineer
E. H. Bauer, Acting Secretary

OFFICIAL PROPOSALS

Bids: November 6, 1952

Construction of Concrete Trestle Sections

Sealed bids for furnishing all labor and materials and performing all work for the construction of concrete trestle sections, requiring 41,380 C.Y. foundation excavation, 252,320 L.F. timber foundation piles, 26,000 L.F. steel shell foundation piles, 20,876 yards of concrete and 45,000 cwt. of reinforcing steel for the high level crossing of the New Orleans, Texas & Mexico Railway over the West Atchafalaya Floodway between Cortableau and Krotz Springs, St. Landry Parish, Louisiana, will be received by F. S. Schwinn, Assistant Chief Engineer of the N.O.T. & M. Railway, 204 Union Station, Houston, Texas, until 10 A.M., Eastern Standard Time, November 6, 1952, and then publicly opened. Further information upon application to F. S. Schwinn, Assistant Chief Engineer.

October 10, 11, 12 and 13.
November 4 and 5, 1952.

Bids: December 2, 1952

Sewage Treatment Plant Additions

Sealed bids for Sewage Treatment Plant Additions at the Sewage Treatment Plant at the Foot of Ferry Street will be received by the Buffalo Sewer Authority, Room 1038, City Hall, Buffalo 2, New York, until 11:00 A.M. Eastern Standard Time, December 2, 1952, and then publicly opened and read aloud.

Form of proposal, agreement, bonds, specifications and instructions to bidders may be examined at the office of the Authority and a copy may be obtained upon a deposit of $50.00 to be refunded upon return of drawings and documents in good condition within thirty (30) days after the opening of bids.

The Authority reserves the right to waive any informalities in or to reject any or all bids.

BUFFALO SEWER AUTHORITY
David J. Laub, Chairman

Dated: October 16 and 23, 1952
Buffalo, New York

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

NOTICE IS HEREBY GIVEN that sealed bids on Specifications No. 703C-285, for furnishing labor and materials and performing all work for the construction of earthwork and structures, Laterals 256-55R and 256.74L, Kendrick Project, Wyoming, will be mailed to P.O. Box 280, Casper, Wyoming, or delivered to the office of the Bureau of Reclamation in time for the public opening at 10:30 a.m., Mountain Standard Time, November 13, 1952, at the office of the Bureau of Reclamation, Reclamation Center, Casper, Wyoming.

Copies of the standard forms and of the specifications may be obtained from the following offices of the Bureau of Reclamation: Avery A. Batson, Regional Director, Building No. 46, Denver Federal Center, Denver, Colorado; and I. J. Matthews, District Manager, P.O. Box 280, Casper, Wyoming. No charge for copies of the specifications and drawings furnished for bidding purposes; for all others $0.75 per copy, not returnable. Payments should be made by check or money order payable to the Treasurer of the United States.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3825) will be received at Boise, Idaho, until November 13, 1952, for furnishing labor and materials for alterations to Arrowrock Dam, Boise Project, Idaho. Location about 14 air miles east of Boise, Idaho. Principal items are: Excavation 5900 cu. yds.; concrete 230 cu. yds.; furnishing and installing 18,000 lbs. metal pipe, fittings, valves, and miscellaneous metalwork; and other work. Completion time 365 days. For particulars, address Bureau of Reclamation, 214 Broadway, Boise, Idaho; or Building 53, Denver Federal Center, Denver, Colorado.

St. Paul District, Corps of Engineers, U. S. Army, 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota. Sealed bids will be received at this office until 2:00 P.M., C.S.T., 19 November 1952, and then publicly opened, for Channel Improvement on Otter Tail River, Minnesota.

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P-5751, Engineering News-Record
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November 13th Issue of

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Close for press earlier than the usual weekly closing time.

The cooperation of advertisers is solicited in forwarding new copy, or changes of copy, to reach us accordingly.

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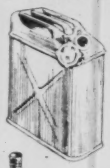

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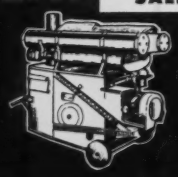

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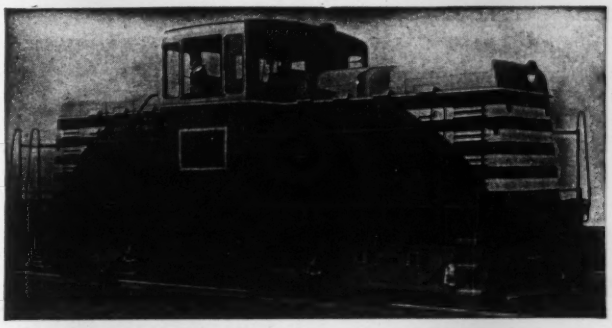

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PIPE COMPANY INC.
ONE OF THE LARGEST STOCKS IN THE EAST
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Your inquiry will have Special value . . .

If you mention this magazine, when writing advertisers. Naturally, the publisher will appreciate it . . . but more important, it will identify you as one of the men the advertiser wants to reach with this message . . . and help to make possible enlarged future service to you as a reader.

French diesel pile hammer works this way:

A French-manufactured diesel pile hammer is being introduced in this country with claims of significant advantages over steam hammers in portability, efficiency and economy of operation.

Basically a free-piston diesel ram engine, the hammer has a 1,150-lb cast-steel piston moving within a cylinder of steel tubing to hit a forged steel striking head. At starting, the piston is raised by a hand winch to a point where a catch is fastened. After it is tripped the piston falls freely, tripping a rod to actuate a fuel pump which injects fuel into the working part of the cylinder. Air is violently compressed in the chamber, atomizing the fuel. The air-fuel mixture heats and detonates, and the resulting power exerts downward pressure on the striking head and simultaneously forces the piston back up for the start of a new cycle.

The piston has an adjustable stroke between 4 ft and 6 ft 7 in. It delivers between 4,500 and 7,500 ft-lb of power at the rate of 50 to 60 strokes per min.

The hammer consumes 0.78 gallons of fuel per hour. Straight diesel oil is used except at atmospheric temperatures below 59 deg F, when a mixture of 85% oil and 15% kerosene is recommended.

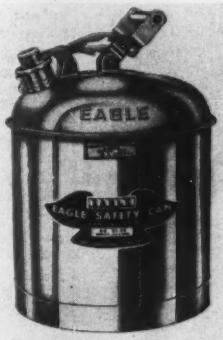
Developed in 1951 by the Germans for combat use, the hammer was taken over by a French group after the war, improved, and since 1948 has been manufactured by the M.T.P. Company of Paris. Distribution in this country is by the M.T.P. Company of America, 14031 Huston Street, Sherman Oaks, California

Caterpillar increases rpm in smaller engines

Caterpillar Tractor Company has started shipments of its D318, D315, and D311 60-cycle, self-regulating electric sets operating at 1,800 rpm. Their 1,200-rpm electric set will continue to be standard, however.

The standard D318 electric set has a 12-hr rated output of 45 kw and the modified model, operating at 1,800 rpm, is rated at 60 kw. With increased rpm the D315 output jumps from 30 to 40 kw, while the D311 jumps from 21 to 30 kw. D311 electric sets also will be available to deliver current in single phase voltages at 1,800 rpm, rated at 25 kw.

Generators are of the self-regulated type and are mounted with belt-driven exciters. Flexible coupling drives the rotor which is carried by two ball bearings. Caterpillar Tractor Company, Peoria 8, Illinois.



Safety can meets state laws, has Underwriters Lab's OK

A newly designed safety can, listed and labeled by Underwriters Laboratories Inc, meets the requirements of all states and municipalities having safety laws for the handling, transportation and storing of gasoline and other inflammable liquids. It also fills the need for an UL-approved safety can for all industries where this precaution is essential to protection of plant or personnel and demanded by fire insurance companies.

A cam-acting connecting arm is of special tapered design; if the can is upset or struck, this arm link tightens the pouring spout seal. The handle is free-swinging for carrying. To pour, engage the handle notch and press the handle down to open the cap.

Cans are available in 1-, 2½- and 5-gal capacities. Body is one-piece Terne coated steel and body and breast are electrically welded together under electronic control. Eagle Manufacturing Company, Wellsburg, West Virginia

Automatic warning switches built into oil reservoir

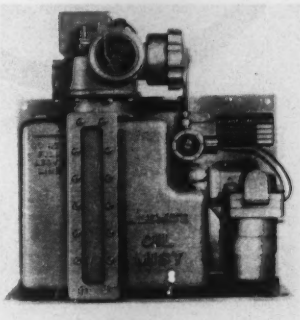
Alemite has developed a new oil-mist lubricator with a one-gallon oil reservoir and built-in automatic warning switch. This device can signal the operator by horn and red light, or can shut off a machine if the oil level becomes too low. Wherever needed, units with 12-oz reservoirs are also now available with these same built-in warning switches.

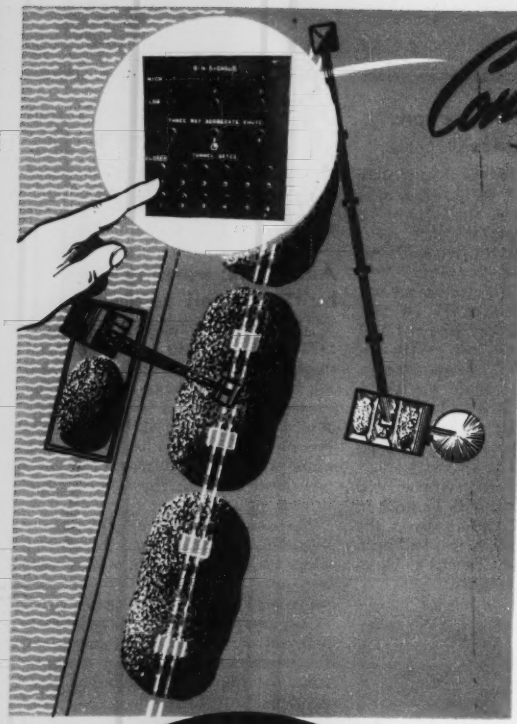
Previous models, through use of a solenoid switch, gave lubrication when the machine on which they were used was in operation, but had provision only for visual check of oil in the reservoir. The new gallon-size reservoir cuts frequency of filling and the signalling device makes it impossible for the unit to run dry accidentally.

Two models are available: One, Model 4958, is wired with a normally open switch to make contact when oil level goes below 23 oz. Model 4859 has a closed switch which breaks contact when the oil level goes below 23 oz and also shuts off the machine immediately.

The same control results with Model 4960 and Model 4961, respectively, on 12-oz reservoir systems—actuating an alarm or shutting off the machine at the 2-oz mark. Alemite Division, Stewart-Warner Corporation, 1826 Diversey Parkway, Chicago 14, Illinois

(*Products continued on page 89*)





Concrete at your fingertips

This ERIE plant is truly a PUSH BUTTON OPERATION

Aggregates are brought to the plant site by barge and loaded into stockpiles over a tunnel conveyor.

An "Aggregate Control Panel" located at the tunnel entrance has bin signal lights which indicate the aggregate level in each bin compartment. At this panel are also located the controls for the air-operated tunnel gates, bin distributor, and belt conveyors—*all under the control of one man.*

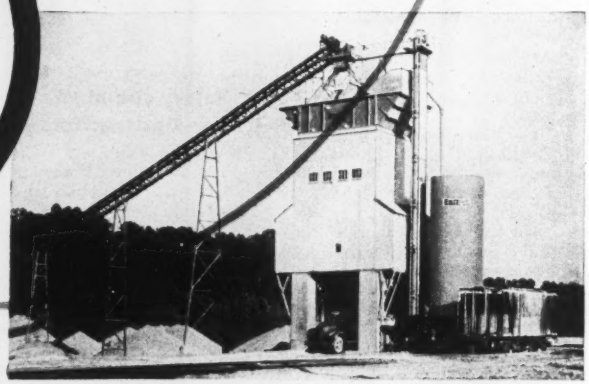
Batching controls are likewise centralized for one man operation. Cement, water, and admixtures are batched automatically while the operator weighs out the aggregates with fast acting air-operated gates.

The two central mixers discharge the specification concrete into a central confining hopper at an average rate of better than 100 cubic yards per hour. Trucks are loaded as fast as they can be spotted.

Take advantage of ERIE'S engineering experience in planning your high production concrete plant.

At left, AggreMeter equipped with air operated gates. Cemeter equipped with vane and screw feeders for automatic weighing and air operated discharge valve.

Below, Erie CTES 202 yd. Bin with 872 bbl. ground storage silo. Sollitt Construction Co., Beverly, Ohio.



ERIE

STEEL CONSTRUCTION COMPANY

1213 GEIST ROAD • ERIE, PENNSYLVANIA

Six-foot fluorescent street light announced

A six-foot fluorescent street light was unveiled recently by General Electric Co. It is said to provide a constant source of virtually glareless light despite outdoor temperature changes which normally decrease the efficiency of fluorescent lights.

The company claims that its new development places fluorescent lights in an excellent competitive position with other types of street lights.

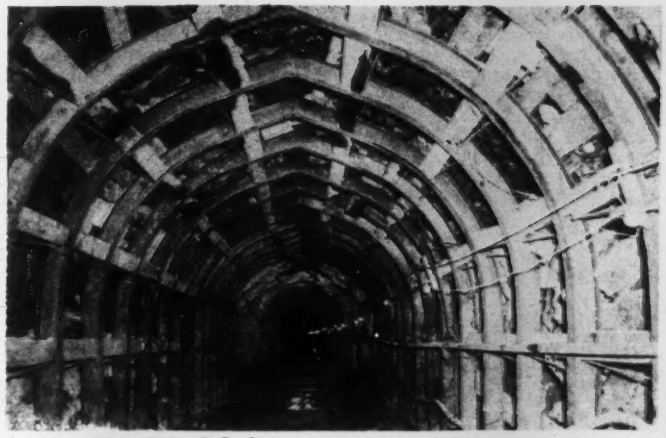
Designated as No. 206, the new GE street light has four 100-watt "rapid-start" fluorescent lamps reflecting through a large, clear plastic housing. The entire fixture weighs about 100 lb, and unlike other fluorescent street lights, houses its own ballast. This gives the new light the added feature of being a compact unit.

The new lamps are said to light within one second after being turned on with no annoying blink or flicker at any time throughout their lives. Maintenance-wise, the new street light has its plastic casing hinged to its aluminum hood, permitting rapid lamp replacement. General Electric Company, Schenectady 5, N. Y.

Front-end loader for Ford or Ferguson tractors

A new hydraulically-operated, front-end loader is applicable to Ford and Ferguson wheel type tractors. The standard material bucket has a capacity of ¼ cu yd or 1,000 lb lift. Called Model WM-4, it is similar to the present WM-3 Wagner loader, but has a closer coupled bucket, longer dump reach, selective lift and height control and heavily reinforced dipperstick.

The pump of the independent hy-



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For permanent stability in any kind of ground, you'll find COMMERCIAL Tunnel Supports are stronger and last longer . . . Your future tunnel projects will benefit materially—both in lower cost and faster schedules with COMMERCIAL supports . . . These easy to install supports are available in every size and radii for every job . . . Details upon request.

THE COMMERCIAL SHEARING AND STAMPING CO.
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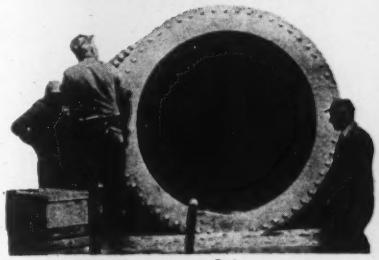

for everything you want in cast iron pipe!

Durable, long-lasting . . . made with the proper crushing, beam, shock and bursting properties for maximum strength. Desirable qualities in any pipe, you'd say? Warren Cast Iron Pipe stays in service . . . it's lasting qualities have been proved by excavated pipe that has been underground for 93 years . . . and *still* in good condition!

Made in all sizes from 2" to 84" with all types of joints. Also manufacturers of special castings in medium and heavy weight Alloy Iron, Grey Iron and Meehanite Iron for special purposes.

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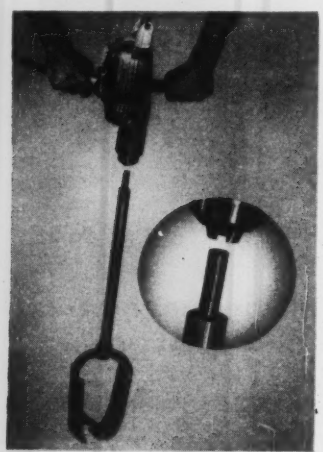
PLANTS: Phillipsburg, N. J. Everett, Mass.
WARREN PIPE CO. OF MASS. INC. 75 FEDERAL ST. BOSTON, MASS.
96 Years of Continuous Service

draulic system is tractor-mounted for correct alignment, driven through a coupling drive. Eighteen different attachments are available for all types of jobs. WAGNER IRON WORKS, 1905 S FIRST STREET, MILWAUKEE 1, WISCONSIN

"Hole-A-Minute" digger fits electric drills

Here's an economical new device to offset the expensive and tedious task of digging post holes. It was devised by a contractor—for use by contractors—and operates with any electric drill of ½-in. size or larger. It's said literally to live up to its name and drill a hole a minute in either hard or soft soil.

Machined from a bar of extra tough, case hardened alloy steel that has been heat treated, it's fully guaranteed by the maker. HOLE-A-MINUTE DIV., EUGENE JOHN FREEMAN & CO., P.O. BOX 2143, VAN NUYS, CALIFORNIA.

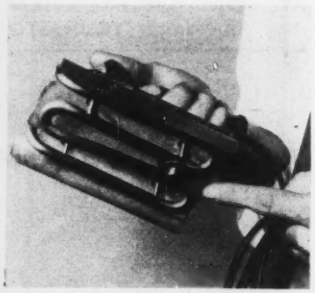


Paint-removing tool uses electric radiant heating

A new type of electric paint remover, designed to remove paint quickly and economically through the use of radiant heat, has been announced by the Industrial Heating Department of General Electric Co.

The new unit consists of two skids under which is mounted a tubular heater rated at 1,000 watts, 115 volts. When the device is slid along a painted surface, heat from the unit causes paint to soften and blister so that it can be removed with a putty knife.

The skids are said to keep heat a safe and constant distance from painted surface while two metal reflectors keep the plastic handle cool at all times. The complete device, to be sold through Sherwin-Williams paint stores, weighs 2¼ lb, and is 6½ in. long. It has an 8-ft heavy-duty electric cord attached. GENERAL ELECTRIC COMPANY, SCHENECTADY 5, N. Y.



Tongue-and-groove hardboard sheets are 16-in. x 8 ft

A new development in the fast growing hardboard industry in the Pacific Northwest is the production of this light, natural wood color tongue and groove panel, 16 in. x 8 ft, designed for fast and easy application of wall paneling over studs or over old plaster walls. The panels are made from refined wood fibers, treated and compressed into smooth hardboard. Trade named Tee-N-Gee, the new panels are produced through a post-treatment process that enables fast production from lumber mill waste at reasonable cost. In panel form this hardboard product is packaged eight to a carton for convenient handling. The panels are applied by nailing or stapling in the ⅜ in. tongue which is covered over by the joining panel,

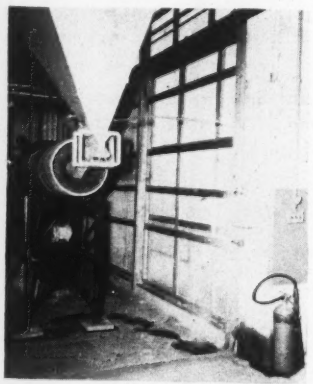
leaving no visible nails or nail marks. FOREST FIBER PRODUCTS, FOREST GROVE, OREGON

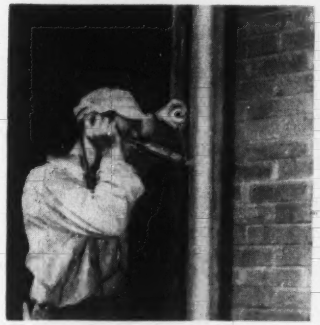
Vimlite replaces glass for many installations

A sizeable increase in the application of Vimlite for both temporary and permanent installations is reported by the manufacturer. Its light-transmitting and insulating qualities, along with semi-rigidity, makes it ideal for office and factory partitions.

Stockroom walls in many factories are being replaced by Vimlite partitions to make use of daylight instead of artificial illumination. Contractors use them in buildings under construction since they permit finishing trades to work regardless of weather, and at the same time provide freedom from dust and provide some control of humidity, heat, cold and drafts.

Vimlite 300-CW is sold in 50- and 150-ft rolls, 36 in. wide. It's made of 10-mesh galvanized wire coated with tough liquid plastic. The 800-CW type is sold in 50- and 100-ft rolls, 28-, 36- and 48-in. wide, and contains 14-mesh wire. ARVEY CORPORATION, CHICAGO, ILLINOIS.





Chromium stainless steel for gutters and downspouts

Type 430 chromium stainless steel is providing the answer to shortages of quality corrosion-resistant roof drainage equipment. It blends well with building exteriors, is durable and weather-resistant, can withstand ice and snow loads without sagging, and resists buckling and cracking from extreme temperature changes.

Another important factor is its abrasion resistance. Often dirt and roofing gravel will wash over roof drainage equipment and eventually wear it away. It will not show loose soluble oxide formations and paint won't wash off due to bleeding of metal underneath. Downspouts in particular, as the illustration shows, can be soldered easily in the field and assembled either there or in the shop. COMMITTEE OF STAINLESS STEEL PRODUCERS, AMERICAN IRON AND STEEL INSTITUTE, 350 FIFTH AVENUE, NEW YORK 1, N. Y.

Briefs . . .

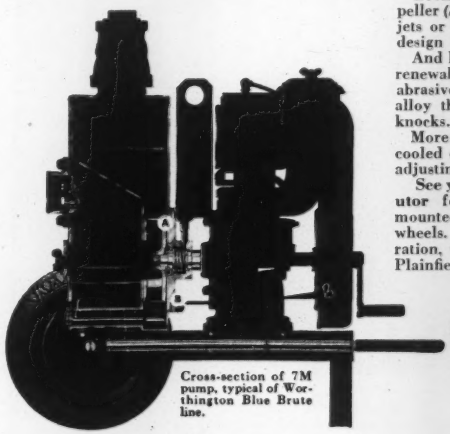
A new line of **temperature and pressure relief valves,** for use on hot water tanks and heaters, has been announced by **McDonnell & Miller, Inc., 3500 N. Spaulding Avenue, Chicago 18, Illinois.** Known as the 202 Series, they are available with standard opening pressure settings of 75 lb, 100 lb, or 125 lb. Temperature relieving capacities for all valves, regardless of opening pressure, is 725,000 Btu/hr.

A line of **heavy-duty, high-pressure shallow well reciprocating type pumps** is being introduced by **Lancaster Pump and Manufacturing Company, Inc., of Lancaster, Pennsylvania** with capacities ranging from 265 to 2,700 gph. Called "Lancaster Giants" they are slow-speed, double-acting and self-lubricating, powered by electric motors or gas engines.

A new **handrail, with flush surface and porcelain enamel finish** that requires no painting has been introduced by **Seaporcel Metals, Inc., 28-20 Borden Avenue, Long Island City, New York.** The handrail is designed with concealed internal bolt fastenings for installation with a minimum of labor and tools and requires no on-the-job welding. Since it is completely prefit, there is no possibility of threads being left exposed to corrode after assembly.

Simplest, sturdiest, most economical contractor's pump ever built

MADE BY THE WORLD'S LARGEST PUMP MANUFACTURER



Cross-section of 7M pump, typical of Worthington Blue Brute line.

It takes Worthington's unequalled experience to give you the most in a self-priming contractor's pump.

Look—only two moving parts, the impeller (A) and shaft seal (B). And no ports, jets or valves to clog. That's the kind of design that keeps you out of trouble.

And look at the materials. Impeller and renewable wear plates made of special abrasive-resisting alloy . . . casing is a steel alloy that defies rust, erosion and hard knocks.

More trouble-savers: easy-starting air-cooled engine . . . fully-enclosed and self-adjusting dual shaft seal.

See your nearby Worthington distributor for the A.G.C.-rated sizes, base-mounted or with steel or pneumatic-tired wheels. Or write to Worthington Corporation, Construction Equipment Division, Plainfield, N. J.

RUGGED LIGHT-WEIGHT PUMP

Popular Worthington 4M has earned contractors' enthusiastic OK on all sorts of jobs. Has fabricated all-steel casing to take roughest service, yet weighs less than 75 lb. Hand carriage also available.

BUY BLUE BRUTES

WORTHINGTON

H.J.9

for every building
Westinghouse

WESTINGHOUSE

SYSTEM PLANNING

Chrysler Building East, center above, reflects modern trend in building design.

Reinhard, Hofmeister & Walquist, Architects; Guy B. Panero, Consulting Engineer; Turner Construction Co., General Contractor; Fishbach & Moore Inc., Electrical Contractor.

PLANNED POWER PAYS

Chrysler again matches modern power with modern building design

When the original Chrysler Building was constructed, Westinghouse helped engineer the most modern electrical system available at that time. Since then, it has given 15 years of outstanding service—a vital requirement for this massive, 77-story structure.

When Chrysler Building East was built, Westinghouse *again* assisted the owners, engineers and contractors to plan a modern distribution system—served by the utility network. Its main feeders are protected by a Westinghouse Standard Building-Type Distribution Switchboard, and the power and lighting circuits are protected by Westinghouse Circuit Breaker Panelboards. Special lighting panelboards provide tenant submetering.

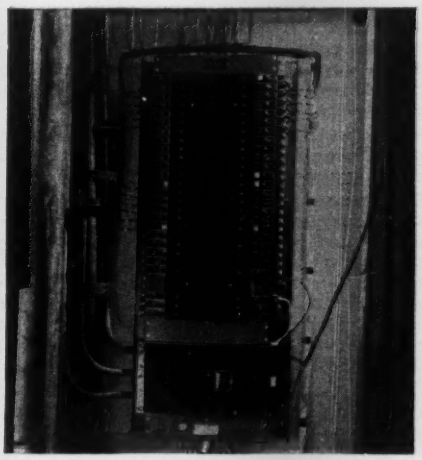
This system assures maximum safety and low-cost maintenance, since there are no live parts exposed to personnel . . . no fuses to replace. It can be laid out and installed easily.

CONSIDER THIS: A building's distribution system is a vital design consideration. It must be treated as an integral part of the over-all design . . . and be *coupled* with distribution equipment of the highest caliber.

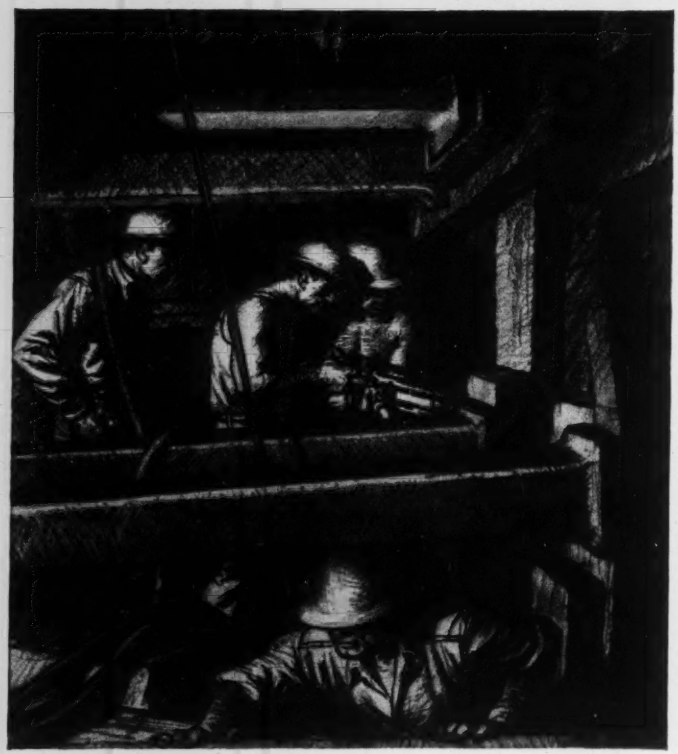
Westinghouse offers you assistance on both of these requirements—and backs it with years of experience. You benefit by getting more freedom in design techniques . . . by providing your customer with the best possible system for *his* building.

There is one best system of distributing electrical power for *every* building. Let Westinghouse help you select it on your next job. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania. J-94958

Westinghouse Standard Building-Type, Metal-Enclosed, Dead-Front Switchboard has full-length pull box at top. This permits neat arrangement of the many large conduits.



Westinghouse Lighting Panelboards are NLAB type with Quicklag® circuit breakers. They are specially designed so that part, or all, of a floor can be metered separately.



On the job...and on the bond

EXPERIENCE COUNTS

To witness the herculean task of constructing a vital transportation link beneath the perilous bed of a surging river is to see revealed the unsurpassed magnitude of the American construction industry.

And to watch the required technical skill and resourcefulness in action is to know the meaning of experience.

The same is true in the related field of contract bonding. The experience of the Ætna Casualty and Surety Company manifests itself in the prompt, intelligent fulfillment of bonding needs on jobs of any type or size . . . by giving speedy, dependable service whenever and wherever you need it. Why not let Ætna's broad experience work for you next time you require a contract bond.

"No Job too Big— No Job too Small"

ÆTNA CASUALTY AND SURETY COMPANY

The Ætna Life Affiliated Companies write practically every form of insurance and bonding protection

LIFE AND CASUALTY
Ætna Life Insurance Company
Ætna Casualty and Surety Company

FIRE AND MARINE
Automobile Insurance Company
Standard Fire Insurance Company

Hartford 15, Connecticut

PUBLICATIONS

The Cadweld Process—This is a method of welding copper-to-copper or copper-to-steel in which no outside source of heat is required. Powdered metal (copper oxide and aluminum) is dumped from a cartridge into a graphite crucible and ignited by means of a spark gun. The reduction of the copper oxide by the aluminum produces molten copper and aluminum oxide slag. The molten copper flows over the pieces in the graphite molds, welding them together permanently.

This booklet includes general instructions, a complete list of accessories, and instructions for many connections. The 76-page book has been completely revised and includes 20 pages on bus bar and tubular bus applications which have increased the needs of Cadweld. ERICO PRODUCTS, INC., 2070 EAST 61st PLACE, CLEVELAND 3, OHIO

Dehydrators—A new bulletin on sand-drag type dehydrators and classifiers has been issued by Pioneer. These Pioneer dehydrators are used for sand production and gravel, quarry and washing plant operation. The new bulletin explains operation of the dehydrator and includes a cut-away drawing, showing construction features. Complete specifications and capacities are listed. For your free copy write to PIONEER ENGINEERING WORKS, INC., MINNEAPOLIS 15, MINN.

Syntron equipment—The condensed catalog of Syntron equipment is labeled No. 525 and is a pocket-size 56-page booklet that lists all of the accompanying equipment, including electric vibrators, vibrating screens, vibratory feeders, batch weigh plants, diesel pile hammers, rock drills, etc. Also listed are the many different sales companies throughout the U. S., Canada and Great Britain. SYNTRON CO., HOMER CITY, PA.

Euclid 15.5-cu-yd scraper—Major design features and detailed specification data on the new Euclid scraper are available in a new 8-page booklet.

The 15.5 cu yd scraper hauls loads of 21 cu yd heaped at a 1:1 slope and 18 cu yd at a 3:1 slope. Powered by a 275 hp engine, it has ten speed transmission and independently actuated hydraulic controls. Top speed loaded is 28.2 mph. Labeled Model TDT, the booklet describing it is form No. 501. THE EUCLID ROAD MACHINERY COMPANY, CLEVELAND 17, OHIO.

Wire in prestressed concrete—From the inception of the original work done in the U. S. on prestressed concrete, American Steel & Wire has supplied stressing strand and wire for experimental and actual construction work. This folder gives basic information on the company's Super-Tens high tensile wire and High-strength reinforcing strand. Tables are included showing minimum tensile strengths and typical stress strains. AMERICAN STEEL & WIRE DIV., U. S. STEEL, CLEVELAND 13, OHIO.

Magnetorque Swing in P&H's 955-A—Bulletin X122-1 of the Harnischfeger Corp. is a 40-p booklet that extolls the advantages of its 955-A excavator, a "Rock-Rated" machine in the 2¼-yd class. Numerous photos (many of them close-ups) describe the features. It's easily convertible for various front end attachments and a split sprocket and drum lagging arrangement eliminates need for auxiliary shafts, gears and sprockets. Lifting capacities go to 60 tons. Write for booklet to HARNISCHFEGER CORP., LARGE EXCAVATOR DIV., MILWAUKEE 46, WIS.

Corrosion-resistant resin coatings—Ricwilite coatings will protect equipment against corrosive conditions in all types of industry with a film resistant to attack by corrosive acids, alkalis, salt water, rust and weathering. Coatings are ideal for protection of ventilating and duct systems, drill pipe, oil refineries, sewage lines, tank cars, etc. Two types are discussed in 4-p booklets: Ricwilite 1060 is of the baking or heat-hardening type; Ricwilite 7100 is a cold setting type cured or polymerized at room temperatures. RIC-WIL PLASTIC COATING & MFG. CORP., 1290 EUCLID AVENUE, CLEVELAND 15, OHIO.

"Cost Control" is the title of a 24-page brochure profusely illustrated with applications of Herman Nelson portable heaters on actual construction jobs involving space heating of working areas, thawing, drying materials, preheating mechanical equipment and scores of other heating jobs.

It explains that most factors affecting costs are the effect of weather and the seasons, the efficiency of labor, the productiveness of machines and even the intangibles of human nature.

A copy may be had free by writing to ADVERTISING DEPARTMENT, HERMAN NELSON DIVISION, AMERICAN AIR FILTER COMPANY, INC., MOLINE, ILLINOIS.

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EDITORIALS

A cost-cutting technique worth trying

ONE OF THE STRONGEST ARGUMENTS in favor of prestressed concrete is that cracking can be prevented under working loads. But crackless concrete is not always necessary. When it is not, greater economy in construction can be obtained by limiting the amount of prestressing force to that required to prevent cracking under dead load and to insure that cracks will close up when live load is removed.

Since conventional reinforced concrete beams are designed on the assumption that they will crack under working loads, the proposal that prestressed beams be similarly treated is not unreasonable. It appears logical that under conditions where reinforced concrete beams have given satisfactory service—where temporary hairline cracks would be harmless—such partly prestressed beams should also be adequate.

These beams differ from fully prestressed members in that reinforcing steel must be added to them to assist the tensioned steel. As pointed out by P. W. Abeles, consulting engineer of London, England, in this issue (p. 32), this additional untensioned steel may be high-strength wire. Then, design stresses in the steel several times that permitted for reinforced concrete may be allowed.

This, however, is a novel concept. Such high stresses are not permitted in reinforced concrete because of the size of the cracks that would form under working loads. But with tensioned steel in partnership with untensioned steel, cracks can be limited to an unobjectionable size, Mr. Abeles claims. Test results and structures built in England in accordance with this theory prove it, he says.

His argument seems sound. Hence, partial prestressing may be worth trying in the United States.

Financing plant dispersion

DISPERSION OF INDUSTRIAL PLANTS is being widely advocated these days to minimize the destructive effect of A-bomb attacks and to improve living and working conditions of employees of such plants. Although this dispersion program has provided many communities with needed new industries, it has also not infrequently required them to provide special concessions. Are these always wise and just? The great importance to the economy of expanding our industrial plant makes it improvident to procrastinate in seeking answer to such a question.

Tax concessions have been used for many years to attract new industries. The chief objection to that method is that it puts a larger tax load on other industries in the community and on the general taxpayers during the concession period. In these days of rapidly rising municipal costs, too many tax concessions can become very embarrassing to a community long before the new industries are carrying their full share of the tax load.

In more recent years a few state legislatures have attempted to meet this situation by authorizing municipalities to float revenue bonds to build plants for new industries. Rent from the plants is used to pay bond interest and amortization costs. That plan has been endorsed as superior to tax concessions, but it also appears to have weaknesses that have not been fully recognized due in part to lack of experience. In Florida, the Supreme Court recently declared the plan to be unconstitutional.

Contained in that decision is a forthright statement that is full of common sense. In declining to approve a plan for issuance of revenue bonds to build plants in North Miami for new industries, the court said, in part, "Our organic law prohibits the expenditure of public funds for private purpose. . . It does not matter what such undertaking may be called or how worthwhile it may appear at the passing moment. The financing of private enterprise by means of public funds is entirely foreign to a proper concept of our constitutional system."

The high courts of other states where this method of attracting new industries is permitted may be more lenient. But there still will remain the danger that here again a municipality may overextend itself. Poor judgment by municipal officers lacking business experience could result in a community finding itself with empty plants producing no rent to pay bond interest. And despite the fact that such bonds are secured only by the rent, default on them probably would depress the value of all securities issued by the community.

An alternative that is in line with what the Florida court called "a proper concept of our constitutional system" is to have such plants built by industrial foundations that use private capital instead of public funds to build the plants. About 70 such foundations have been set up in this country. They keep the financing of new sites, or new plants, in private hands; and because private investors have put their own money into these foundations, more business acumen generally goes into selection of companies to be offered new facilities.

A similar service, the possibilities of which have not been fully explored, is now being offered by some insurance companies. It is not limited to new industries.

Both dispersion of industrial plants as a defense measure and decentralization as a social betterment plan may result in long continuation of this shifting of industries to smaller centers of population. Consequently, the subject of how best to facilitate such movements could profitably be studied in detail by many men in municipal service.

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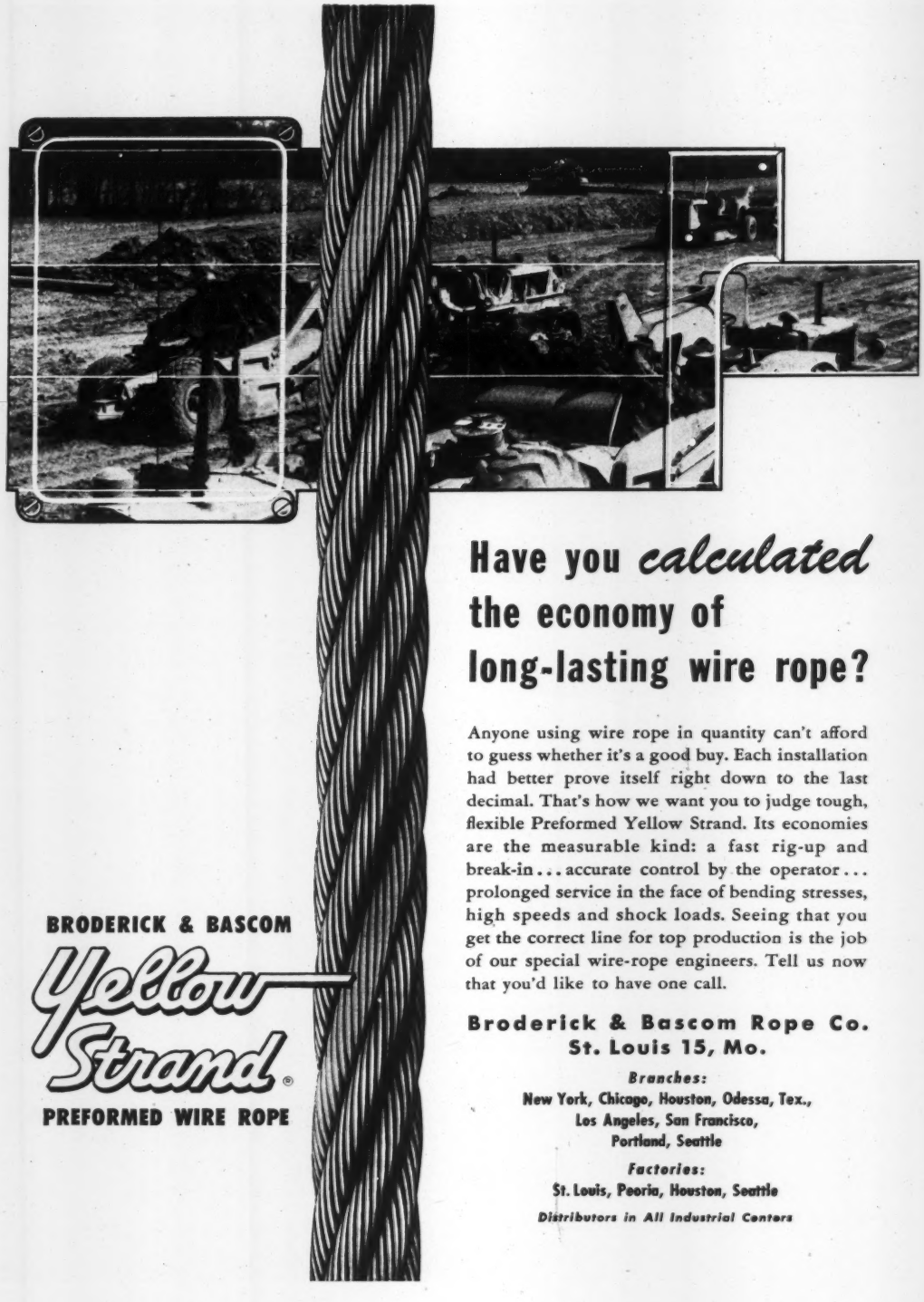

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